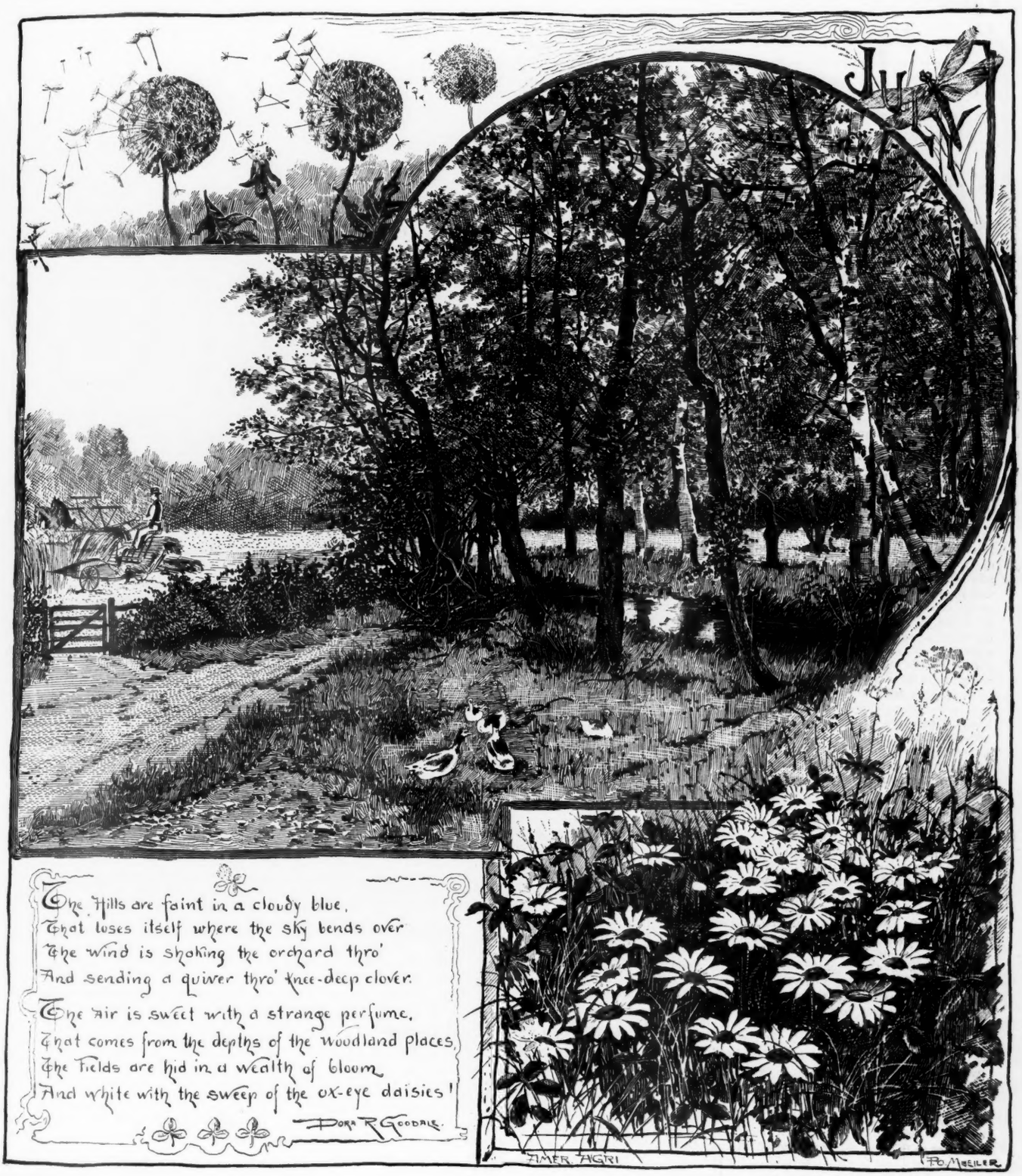
AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

VOLUME XLVIII.—No. 7. NEW YORK, JULY, 1889. NEW SERIES—No. 510.



The Hills are faint in a cloudy blue,
That loses itself where the sky bends over
The wind is shaking the orchard thro'
And sending a quiver thro' knee-deep clover.

The air is sweet with a strange perfume,
That comes from the depths of the woodland places,
The fields are hid in a wealth of bloom
And white with the sweep of the ox-eye daisies!

—DORA R. GOODALE.

COPYRIGHT, 1889, BY THE ORANGE JUDD CO.

ENTERED AT THE POST OFFICE AT NEW YORK, N. Y., AS SECOND CLASS MATTER.

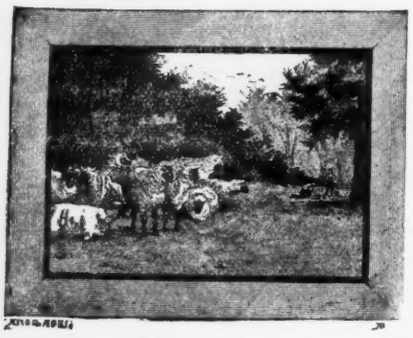
July.

A rhythm of reapers; a flashing
Of steels in the meadow; a lashing
Of sheaves in the wheatlands; a glitter
Of grain-builded streets, and a twitter
Of birds in a motionless sky,
And that is July!

JAMES N. MATTHEWS.

FARM · AND · GARDEN · WORK

JULY, 1889.



One of the disadvantages of our farm life is its isolation. On many farms the members of the family, save an occasional passer, see no one outside of their own circle for days and weeks in succession. Hence we favor every proper occasion for bringing the members of a farming community together, that they may become acquainted with one another, and act together for the promotion of the general welfare. The celebration of the Fourth of July is one of those occasions. If there is to be a community or neighborhood celebration all the better. To have this, a few must act as promoters. Often the labor will fall on one, who must act as prime mover and attend to the necessary details. If a community celebration is not practicable, hold one for the family. We, some years ago, attended a celebration on the farm of one whose early life was passed in a city. In giving some recollections of his early days, he said that for many years of his boy-life, the Fourth of July was to him a day on which he could do everything that he could not do on other days.

Why do We Celebrate the Fourth of July?—How many boys of sixteen years can give a correct answer, and why we commemorate this above most other days, should be learned at the celebration. Whatever else may be done, let the Declaration of Independence be read. To make this unlike other days, let the whole family repair to some pleasant grove, taking along the materials for a picnic or open-air feast. If there are any singers among them, let "Hail Columbia," "The Star Spangled Banner," "Red, White and Blue," "America," or other patriotic songs be sung. Let a good reader read the "Declaration," and if any one can make a speech suited to the occasion, and not too long, encourage him or her to do so. Swings and other suitable amusements should be provided and the day be made an enjoyable one.

Haying and Harvest is usually a season of hard work, and its conclusion should be marked by a vacation, in which rest and recreation should be the chief objects, to be taken according to the peculiarities of the locality. If there are good opportunities for fishing near, lake or river, many will prefer to make this vacation a fishing excursion; but whatever form, let it be such as the whole family can enjoy, and if "haying and harvest" is a period of hard work, let "after haying and harvest" be marked by a period of enjoyable recreation.

Live Stock.

In domesticating certain animals, we make them conform their habits to our own purposes, and as an offset to this, we relieve them of all trouble in hunting for their food. In providing for the various comforts that they would seek in the wild state, one is often overlooked — that is, shade. Look at animals in a pasture in which there is abundant shade, and where do you find them during the hot portion of the day? Certainly not exposed to the sun, and grazing, but every one, whether horses and cattle or sheep and pigs, quietly resting and endeavoring to digest in the shade the food they have eaten earlier in the day.

Bathing.—While we advise frequent bathing for the farmer and his hands, we would also provide bathing facilities for the domestic animals. Fortunate is the farmer whose land borders upon a lake or a stream of sufficient depth to allow the horses, cows, etc., a frequent bath. Not only will the animals enjoy it, but the boys will find it more fun than work. Often a small stream may be so dammed as to retain the water and form a suitable bathing place. Do not allow the animals to drink from such artificial bathing pools, especially if the bottom is muddy.

Cold Water.—Water from some wells is too cool to be given to animals. Especially in very warm weather it is judicious to draw the water long enough in advance to allow its chill to be removed before the animals drink it, especially if they are fatigued. A handful of fine corn meal stirred into a bucketful of water will be acceptable, and prevent injury from excessive drinking of cold water.

Orchard and Fruit Garden.

Pruning.—There has been much discussion as to the best time for pruning. The weight of testimony is in favor of this month, as at this season the wounds heal more rapidly. All large wounds, made at any season, should be protected from the weather by a coating of melted grafting wax, or thick coarse paint.

Avoid Pruning of all large branches. The largest branch had its origin from a bud; had this bud been cut away, or better yet, rubbed off, in its infancy, there would have been no branch demanding pruning. One who has the care of trees should foresee what will be the contour of the tree if allowed to grow uncontrolled, and anticipate the removal of large branches by allowing none to grow where they are not needed. Only a thinking man should be trusted with pruning.

Currants.—The destructive currant worm, which makes such havoc with the leaves of the currant and gooseberry, completely stripping them of foliage if not stopped, comes from an egg, laid by a fly that comes out of the ground as soon as the leaves appear. When there are but few bushes, it will pay to examine the under sides of the leaves, especially the lower ones, and crush the eggs between the thumb and finger. Usually the worm is not suspected until holes appear in the leaves. The best remedy is the white Hellebore (*Veratrum album*). It is usually kept in the form of powder at the drug stores. Some apply it by sprinkling it upon the leaves when the dew is on, shaking it from a tin box with holes in the cover, like a kitchen "dredging box." As the powder causes most violent sneezing, we prefer to apply it with water. We place an ounce or two of the powder in a pail, and first use boiling water, enough to wet it thoroughly, because hot water wets it more quickly than cold. After this is thoroughly melted, add cold water to fill up the pail. Apply by means of any convenient garden syringe, endeavoring to reach the under side of the leaves. If, at the end of two or three days, any live worms are found, repeat the application, but one thorough dashing is usually enough. White Hellebore is poisonous, but it is so acrid that one is hardly likely to take it by mistake. Still, it is best to be careful with it.

Strawberries.—As soon as the fruit is all gathered give the beds a weeding, and apply a dressing of well decomposed manure. If new plants are wanted, allow a sufficient number of runners to take root, and cut off all others as they appear, unless the beds are treated on the renewal plan, when they will be needed to form plants for next year's supply.

Kitchen and Market Garden.

Those who cultivate vegetables for a living keep the ground always at work and earning something. No unoccupied spaces are seen, and as soon as one crop is off another takes its place. There is no reason why the family—or farmer's—garden should not be managed on the same plan. The market gardener exacts much from his land, but he feeds it well. He uses more manure on five acres than some farmers apply to their whole farms.

Beans.—A succession crop of early varieties may be sown if string beans are wanted later, and the Kidney, or any other kind are grown for ripe beans. Keep them well cleared of weeds. Planted wide enough apart to allow of the use of a cultivator, they may be kept clean with comparatively little labor.

Cabbages.—Transplant the late varieties from the seed bed. The crops can be grown with but little labor by marking the land three feet each way, and setting the plants at the crossing of the mark; this will allow the plants to be cultivated both ways by means of a cultivator. If some seed of Savoy cabbages were planted, the cabbages will be found so superior to the common kinds that they will always be sown hereafter. They are the hardiest as well as the finest of all cabbages.

Cauliflower.—There is no reason why every farmer's family should not enjoy this, the most delicious of the cabbage tribe, as well as that of the "gentleman farmer" who can afford to hire a "regular gardener." The care which will raise a good crop of cabbages will raise a good crop of cauliflowers. Abundant manure, with thorough and careful cultivation, are the secrets of success. Of course good seeds, of a good variety, are essential.

Carrots.—Continue to cultivate until the growth of leaves prevents it. We have noticed of late years a greater tendency in carrots to run up to flower than formerly. Seed growers should look into the cause of this.

Celery.—If good plants are ready in the seed bed, the middle of this month is early enough to set them out. Thorough preparation of the soil, abundant manuring, and thorough working of the soil with roller and harrow. The plants are set on the land surface in rows, three or four feet apart, and the plants six to twelve inches in the row, according to the character of the soil; the richer the soil the nearer the plants may be set. Of course the crops will need frequent and careful cultivation. Celery makes its most rapid growth when warm days are followed by cool nights,—and so do some weeds.

Corn.—If one wishes to prolong the season of sweet corn until frosts come, a few rows of some early varieties may be planted now. They may furnish acceptable late picking before frost comes.

Egg Plant.—The Colorado Potato Beetle is very fond of egg plant, and it often destroys them if hand picking and poison are not used in time. Liquid manure and frequent use of the hoe will stimulate growth. Place a mulch of hay or straw to keep the fruit from the ground.

Lettuce.—In hot weather the plants are apt to run to seed. This can be in part prevented by setting the plants in partial shade, and giving very rich soil. The "Deacon" lettuce has given us better heads in summer than any other variety we have tried.

Sweet Potatoes.—In hoeing the ridges move the vines in order to prevent rust.

Tomatoes.—Reserve the earliest and the most finely shaped for seed. Make catsup and tomato sauce while the fruit is in its prime. Keep the vines to trellises or stakes, and cut back all superfluous shoots. Those who have greenhouses should root cuttings from selected vines. These plants can be kept through the winter without making much growth, and give fruit very early when set out next spring.

Lawn and Flower Garden.

In a hot, dry spell, the grass makes but little growth, and the lawn at such times is injured by too much mowing. The most troublesome weed in our lawn, the soil of which is very sandy, is the Crab-grass (*Panicum sanguinale*). This is a late annual, the stem of which lies prostrate, taking root at every joint. The flower cluster grows on stems tall enough to be cut by the mower. As it is an annual, the preventive of seeding should exterminate it. The mowings should be raked up and burned, for fear that some seeds may ripen.

When ornamental shrubs are out of flower, it is well to cut away the flower clusters and not allow the shrubs to exhaust themselves in ripening seed, save those with ornamental fruit. The same may be said of herbaceous perennials, though of these seeds are often wanted. The garden should now be gay with gladioluses, lilies and other summer blooming bulbs. Provide those that need it with stakes. Greenhouse plants turned out into the borders should not suffer for want of water. If such plants are to be taken up later they should be pruned with this in view. Many herbaceous perennials succeed best from the seed, if these are sown as soon as ripe, the plants getting large enough to stand the winter with slight protection.

THRESHING DAY.

"OLD FARMER."

Ah me, how many threshing days do I remember—some sad ones and some pleasant ones. Sometimes the crop proved almost a failure, and sometimes it turned out better than we expected, and the good wife rejoiced and cheerfully gave the threshers and all hands the best the house could furnish. In my younger days we were threshing more or less all winter. Now a ten-horse power steam thresher does the whole work sometimes in one long day and always in two days. It is a trying time. The hopes and fears of a whole year are brought to the test. It is a busy time for the farmer, and if he is not careful he will be likely to overtask himself. If he is wise, nothing but absolute necessity should induce him to "cut bands" or take away the grain or build the stack or undertake any work that will confine him to one spot. He can always find plenty to do. Sometimes the men who are pitching the grain to the machine may come across a lot of rakings, and a little help will encourage them. Sometimes the man who is carrying away the grain will find the granary choked up, and the farmer, by the vigorous use of a scoop shovel, will make all right again in a few minutes. Sometimes the wind may bother the men on the stack, and a few words of encouragement and sympathy, with a little assistance, will put new spirit into them.

The essential points to look after are: 1st. The granary. It may need a few strips of tin to make it rat and mouse proof. Recollect, also, that you have not only to get the grain into it, but also to get it out again—and it sometimes happens that it is necessary to get it out sooner than you expect. Should it get warm it will be necessary immediately to turn it or spread it out on the barn floor, or run it through a fanning mill. 2nd. See that the machine threshes clean. If not, lower the concave. See that no grain is carried over with the chaff. Occasionally the threshers have a visitor who wants to feed the machine, and he crowds in the sheaves, and the sieves cannot properly clean the grain, and more or less of it passes over on to the straw carrier. 3rd. Look to the straw stack. This is an important matter to those of us who feed out the straw. The great secret of making a stack rain-proof is to keep the middle full and well trodden down from the start, so that when it settles, the outside will sink down lower than the inside. When you begin to build the roof, the part that needs the most care is immediately under the straw carrier. The chaff is apt to accumulate there, and when the machine is removed there will be a depression in the stack at this point that will let in the rain. Take special pains to put some layers of long straw under the straw carrier. Many of our straw carriers are not long enough, and if it is necessary for a man to throw the straw up on to the roof of the stack, drive some long poles into the stack and place an old door on them for the man to stand on. If this is not done, the place where he stands will be a hole difficult to fill up so that it will shed the water. The farmer, if he is wise, will frequently be on the straw stack during the day and help to tread it down in the middle, but for his own safety and for the good of the stack he will not venture too near the outside. 4th. Look out for fire from the engine, but in point of fact there is more danger from tobacco smokers than from the engine.

GOOD BUTTER MAKING.

JOHN GOULD, OHIO.

It may be A. D. 1915 before the co-operative creamery, in some of its forms, will have superseded farm butter-making, however desirous we may be of its earlier adoption by dairy people in general. In the interval, an immense amount of butter will continue to be made at the farm homes. That this butter would make a motley collection as in the past, none can dispute, but there is after all a constantly increasing amount of good butter put upon the market. If people could be induced to discard their individuality in making, and adopt some few, definite rules, so that butter-making could have system and sameness about it, there would be a great advance made. Too few realize that their way of making is not the method by which the butter is made which brings the highest price. No one is selling butter now at advance, and paying prices, who still clings to "Grandmother's" way of making. Neither does the market put a premium on butter made from actively sour cream, nor butter with pronounced butter-milk flavor, or made sharp with over-salting. Butter, to bring a high price, must be made of cream not over thirty-six hours old, slightly acid. It must be washed free from butter-milk with weak brine, and salted not to exceed three-quarters of an ounce to the pound. Butter also needs to be packed in some of the cheap but tasteful packages now obtainable, and sent to the market immediately. Long-keeping butter is no longer called for. Butter is made to sell, not to keep, and the consumer says, "to eat fresh, not held until devoid of fine flavor, or aroma." The great evil is that so much butter is made by those who have a few cows that they cannot make a specialty of fine butter-making, and so make as best suits them. This butter made from old, and often fermenting cream, is at the start destitute of butter flavor. It is not washed free from butter-milk, but "worked over" with ladles, "balled up" and sent to the grocery store, unprotected from the light and air, and then consigned to the "shoe box." When at last, weeks, may be, though it should only have been days at the most, this butter finds its way to the city market to be rejected and neglected, it is finally sold for a few cents per pound, and actually scoffed at by the proscribed oleomargarine.

This making an originally good material into a low-priced, objectionable article, that does not attract but lowers the price and lessens consumption, should be stopped. It is both unprofitable and unbusinesslike. The market wants good butter, and discards poor. Why, then, insist upon furnishing the latter? If one cannot make a fine article and get a good price for it, either change methods, quit the business, or, what is better, patronize a co-operative creamery. There the material of a whole neighborhood can be massed, rules of production adopted so that substantial uniformity will be secured, and a final product turned out that finds its way—at popular prices—to consumers of good butter. The one is money losing; the latter is money making. Which shall be the choice?

THE SMALL FARMER IN THE NORTHWEST.

RICHARD WAUGH, MANITOBA.

"Extremes meet," and all through the wide territory where Eastern capitalists went in with a rush eight or ten years ago to coin money by bonanza farming, there are scattered thousands of homesteaders who, almost without capital except a few dollars to make their entries and strong reliance on their industry and endurance, go out in hundreds year by year to take hold, and in ways little known by outsiders manage to keep hold, till they can call that land their own. If they steer clear of the three-per-cent-a-month men, and have fair seasons to begin with, they can succeed. Such men, and even some few women, do it in some such way as this: They hire with some farmer in the busy seasons of seeding, harvesting and threshing, at the latter work especially, earning high wages. But wages is not an object at the first start. In exchange for six weeks' work at seed-time, a man acquires just enough to make his entry at the land office and buy boards to fit up a shanty (sometimes it is a sod shanty). He gets the use of a yoke of oxen to do his "breaking," beginning in May or early in June. Thirty days' breaking means from twenty-five to thirty acres, if these oxen are in good condition, and the season is not too dry. There is plenty of grass, and if kept at work in the cool of the morning and evening, good oxen can turn an acre a day. Then the pioneer builds a larger sod shanty for his oxen, when he has them of his own. He may then "backset," going an inch or more below the first breaking. He may now leave that land for the season, return the oxen to their owner, and, if wise, try to keep good friends with him and stay over the fall—say from the first week of August till nearly the beginning of the next year's operations. In that time there will be wages enough coming to buy his own oxen, and if he has managed properly he will get the loan of a plow, and all the seed he wants on time. Character is the main thing. Once one's neighbors are satisfied that he is the right sort, he will have real friends, and can get his seed in even without oxen of his own. "Changing" again his work for that of the oxen, he breaks and backsets twenty acres more the next summer, and arranges for spending even a part of winter on his claim. The harvest and threshing will supply more funds, and if he has been fortunate enough to escape hail and frost, he may have six hundred or more bushels of wheat from the first year's breaking. It may be as wise to fall back on the settled country for that second winter, working for little more than food and shelter. There are now fifty acres for seeding, which means one thousand bushels of hard wheat, if our pioneer is again in luck. It becomes possible at this stage to think of living altogether on the homestead and trying to build a house on it. It takes a good deal of grit and self-denial to get along through these first years, and the homesteader's fortunes may get "busted" by half an hour's hail, or the death of oxen, or a prairie fire. The

hail is the only thing for which I have no specific to offer. All the rest may be got over with prudent management and a favorable providence. The Northwest is one of the healthiest countries in the world, and though no fit place to start on with a wife and very small children, the prairie is a perfect land of Goshen to men whose fathers grew prematurely old clearing away the forest and stumps in twenty years from what an active man may here get in a crop within twenty months.

I have tried to condense in a few sentences what I have learned from hundreds of such men in my wanderings. Four years ago I drove through a settlement of ten families, not one of which had a nickel. Most of them are fairly well-to-do to-day, but their experience would hardly fit neatly into a fairy tale. There is no romance in such a life. The monotony to people with few intellectual resources is sometimes very depressing, but a poor man who keeps clear of whisky and chattel mortgages may get to be independent in a very few years. The brilliant sunshine and stimulating atmosphere cannot be too highly praised. Even the Winter has its compensations, and as one man, who had tried both ways, said to me, "I can force out cold, but I can't keep out fever and ague." I "coached" a very good man three years ago in the best methods of taking hold, and am now very proud of my pupil. He has one hundred acres broken with one team of oxen, has some other stock, a good house and roomy stable, with less than two years of actual work on his homestead. He is a rustler and a good Methodist, and I think for his station in life in a fair way to make the best of both worlds.

NITRATE OF SODA—ITS GRADES AND USES.

JOSEPH HARRIS.

The chief point from which nitrate of soda is obtained is Iquique, Chili. There is an export duty on it of ten dollars per ton. There are vast beds of it extending for two or three hundred miles along the west coast of South America. These beds are supposed to have been formed from decomposing sea weed.

There are two grades of nitrate exported, one that is almost chemically pure, that is used for the manufacture of nitric acid and other chemical purposes, as well as for cheap blasting powder and fireworks as a substitute for saltpeter (nitrate of potash); the other grade contains four or five per cent of impurities, principally common salt, and is sold at a lower price for manure. This cheaper grade has not, as yet, been imported into this country, owing to the fact that nitrate of soda is almost unknown as a fertilizer with us, and it does not pay the importers to keep it. The few farmers who use nitrate of soda in this country have to buy the high-priced pure article.

In Europe, where enormous quantities are used for manure, especially for sugar beets, the cheaper grade is imported; it is ground fine, and the farmers have no trouble in getting or using it. In this country the importers do not care to bother with the small quantity at present used by farmers.

The nitrate is shipped in strong, coarse bags holding about three hundred pounds each, and by the time they arrive here the bags are more or less rotten, and before they can be sent out the nitrate must be re-bagged. This is done, not by emptying the old bag, but by slipping a new and larger bag over it. Before sowing the nitrate empty the bags on the barn floor and break up the lumps and run it through a sieve. A sieve used for sifting ashes will do, though a finer one would be better. Break up all the lumps and keep sifting and breaking until all will go through the sieve. Four or five pounds of nitrate will adhere to the bag and cannot be removed. Our own plan is to soak the bags in a barrel of water and use the nitrate by pouring the solution on the ground among peach trees, grape vines, gooseberries, currant bushes, etc. In pouring it on the ground care should be taken not to let it splash on the leaves, as it will be apt to injure them.

After sifting the nitrate, sow it broadcast, but it should not be sown on the leaves when they are wet with dew or rain. If superphosphate is sown with nitrate of soda the two may be mixed together, if dry and the mixture is used immediately. If damp and the mixture is allowed to remain unused for some weeks, there is more or less loss of nitrogen. This is one reason why our manufacturers of fertilizers do not use nitrate of soda. There is not only a loss of nitrogen, but the mixture becomes damp and lumpy in the bags and is difficult to drill. For this reason nitrate of soda will always have to be purchased separately, and farmers will have to do their own mixing. As soon as the nitrate producers in South America learn that fertilizers are used in this country they will probably afford us the same facilities for getting it as exist in Europe. At present not a pound of fertilizer nitrate is imported into this country, while the imports to Europe last year, largely of fertilizer nitrate, aggregated 4,807,000 bags of about three hundred pounds each.

SOD GROUND FOR POTATOES.

A. B. ALLEN, NEW JERSEY.

A decomposing sod makes the best bed for growing potatoes I have ever tried; but to succeed well it must be properly prepared. The grass should be suffered to grow till about the first of June, or if a little later at the North it is still early enough for planting to insure a good crop. Now take a plow with a wide, flat share, quite sharp at the edge, with a sharp coulter on the end, or in the absence of this fasten a coulter to the beam. With such a plow sod can be turned flat over about one foot wide. This is absolutely necessary in order to cover the grass completely and insure its gradual decomposition with the turf through the season, to furnish nutriment for the growing crop. The turned sod ought to be three to four inches thick. If thinner than this it does not protect well from a drought, and if thicker it does not decompose as thoroughly as is necessary.

Holes for planting may be cut open with a hoe blade, about three inches wide and as many deep, and six inches apart where every third furrow joins its edge to a fourth, and the seed be planted in these holes. This makes the rows three feet apart. Do not disturb the sod in endeavoring to hill these rows, for a flat cultivation is best, and so few weeds will grow on the surface that it will not be necessary to plow it, which if done will injuriously disturb the sod. All that is necessary is, when the potato vines have grown up two to three inches, run a broad, sloping tooth harrow over the ground, and it will effectually destroy all weeds and stir the surface enough to keep it mellow.

Thus treated, a soil of moderate fertility will produce a good crop, but if it is so poor as to require fertilizing, do not spread stable manure or putrescent compost on top of the sod and plow it in, as some recommend, for if the growing tubers touch this—as they must—it endangers their rotting, and in any event makes them less mealy, and injures their taste. If such manure is used it should be spread on the ground after being well harrowed between the rows. It will then operate as a beneficial mulch during hot weather, and as rain dissolves the salts, the liquid will be carried down through the turf to benefit the crop. The best thing to use is the potato fertilizer, applied on the bottom of the furrow as fast as the sod is turned up, and let this cover it. Some recommend spreading this fertilizer broadcast over the ground after the potatoes are planted, and harrowing it well in. I have tried this method of application, and found little benefit from it. If a moderate amount of rain falls during the summer the turf will get well rotted by Autumn, and the soil be in admirable tilth for a wheat crop, or in spring for any other crop the farmer may wish to cultivate.

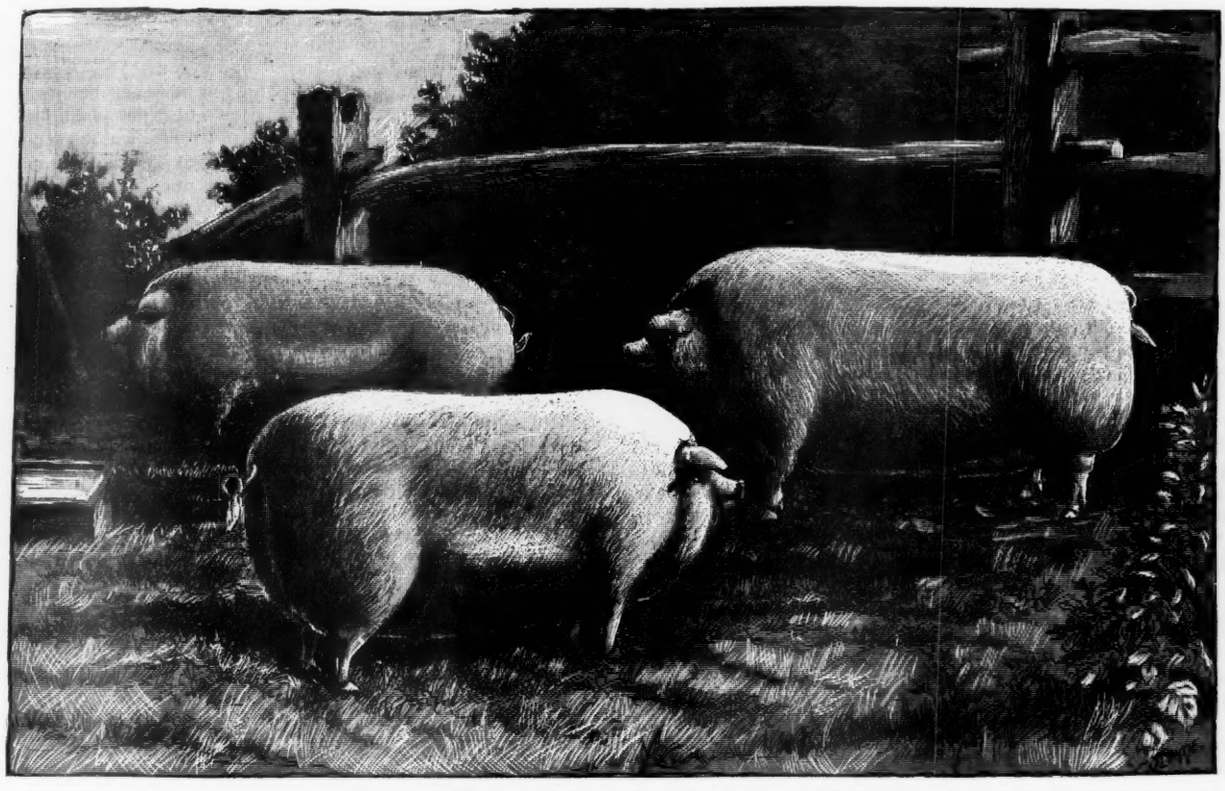
On the sea coast sea-weed is extensively used for fertilizing the potato crop, and it is contended by many there that this is equal to interior sods; but it is not the case, for the weed gives a tang to the potatoes which often makes them so very disagreeable for eating at the table as to condemn them entirely to cattle food. They grow extra large from sea-weed, and as they are dug have a fine, smooth appearance. I should think that if a quart or so of slaked lime was well spread around the seed when planted this might neutralize the tang and render the tubers palatable for the table.

Chaff.—In old times, when grain was threshed with a flail, farmers took special pains to save the chaff. It is more nutritious, and when free from dust, more palatable than straw. A certain quantity of chaff was mixed with the grain fed to horses. When machines were introduced for cutting hay or straw into short lengths they were called "chaffing machines," and the cut hay was called "chaffed hay" or "hay-chaff." In other words, we cut up our hay, straw and stalks to take the place of chaff. The American threshing machines knock out the grain, clean it and carry straw and chaff together on a "straw carrier" to a straw stack. There is no provision for separating the chaff from the straw. But the more conservative English farmers could not so readily change their practice of feeding, and insisted on having machines that would keep the chaff separate. And they got what they wanted. We do not want such machines here, for the simple reason that not one farm in a thousand has any "chaff house" or place intended for keeping chaff. Nevertheless, it is well to know that chaff is valuable, so that whenever we have an opportunity of saving it we may do so.

CHESTER WHITE SWINE.

No other American breed of improved swine has been the subject of such diversity of opinion as to its merits as the Chester White. It is one of the oldest breeds of swine originated in this country; it has enjoyed its seasons of great popularity and equally warm criticism; and has through it all become generally recognized as one of the permanently established breeds of American swine. The breed was first known, seventy years ago, in Chester and Delaware counties, Pennsylvania. The foundation stock, like that of most of our American breeds of swine, was originally imported from England. At that time the large white swine were bred there under various local names, and with slight local variations. A strain of these was bred by the Duke of Bedford, from which fact the importer called them the Bedfordshire. They were large and rather coarse, but a cross with the compact little China breed corrected that, and produced a breed of smooth, well proportioned white hogs, easily fattened, quiet, good graziers, and every way a decided improvement on the swine hitherto bred and reared. Specimens of these white hogs were exhibited in various places by breeders of Chester and Delaware counties, winning prizes and admiration generally, but were nameless. At length they were called the Chester County Whites, but the name was soon simplified to its present form. The Chester Whites became very popular, and fifty years ago an active call for them came from the fertile valleys of Ohio and Indiana. There was no organization among breeders, and while many conscientious men bred them carefully within blood lines, there were less scrupulous ones who did not hesitate to sell and send westward any kind of white hogs they could pick up. So it came about that a cloud of obloquy was brought upon the white swine of Eastern Pennsylvania, from which the really meritorious suffered unjustly. But the wide-awake, intelligent breeders of Chester Whites have changed all that. The National Chester White Association embraces in its membership men who are able not only to breed to a high standard, but also to protect themselves and the public from imposition. The association publishes a register at such intervals as the business demands, and the Chester Whites are bred uniformly and pure. The following is the standard for the breed adopted by the National Swine Convention: "Head short, broad between the eyes; ears thin, projecting forward and lap at the point; neck short and thick; jowl large; body lengthy and deep; broad on back; hams full and deep; legs short and well set under for bearing the weight; coating thinnish, white, straight, and if a little wavy not objectionable; small tail and no bristles." In addition to the National Chester White Association, there is another called "Todd's Improved Chester White Record Association," representing a breed which is an offshoot of the older one. It was formed by crossing them with the Irish Grazier and other breeds, with a view of improving them in some particulars.

In general, the distinguishing characteristics of the Chester Whites are early maturity and tendency to lay on flesh from the first. Pigs make well-matured porkers at seven to nine months. If kept to greater age they keep right on growing, and thus acquire a tendency to coarseness, which has been brought up by their opponents as a defect. But properly managed and brought to the knife at the right time, the Chester Whites are valuable swine, and fully worthy of all the popularity they have ever enjoyed.



PURE-BRED CHESTER WHITE SWINE.

MONEY IN RAISING TURNIPS.

L. HILL, CONNECTICUT.

If turnips are not worth as much as corn meal they do not cost as much, and as an appetizer they have no equal. There are few crops that pay a better profit, especially to farmers three to ten miles from manufacturing towns or cities, where a bushel of winter turnips rarely sells for less than forty cents. It is not at all uncommon to get two hundred and fifty to three hundred bushels from an acre, and the yield is often more. At even forty cents and two hundred and fifty bushels the income per acre is $100. Increasing each fifty per cent (an expectation that is not at all extravagant) the acre will produce $200. The expense is as follows: $5 for plowing twice, $3 for two thorough draggings, $25 for manure or some appropriate commercial fertilizer and enough more for hand labor to make with the taxes on the land $45 per acre, and the profit is $55 in the former case or $155 in the latter. Besides, if the owner be a good calculator he can often get some other crop as a by-product. I have raised a crop of nice oat hay followed by turnips at the rate of four hundred bushels per acre in the same season. To do this, plow greensward, or turn over the early potato ground the previous autumn, and a month later harrow the field thoroughly. This will kill all the weeds. Draw on the manure, or if phosphate be used sow it with the oats and harrow both in before others have plowed for oats. Having the plowing done in the Fall the oats can be sown early and start betimes. Let them be cut in the milk and made into hay, and the ground plowed the following day if possible. Have the harrow follow three days later to kill the

young weeds that have started, and sow the turnip seed at once, bushing lightly. With this, give a light dressing of ashes or some other good fertilizer. This is an excellent time to seed the field to grass if it is desired. Hard or winter turnips should be drilled in rows three feet apart with some quick-acting fertilizer in the drill. In the latitude of New York city the seed should not be put in the ground before the latter part of June or July 1, and the sowing can be continued as late as July 15. Thin them out to six inches apart at least and cultivate two or three times. A pound and a half to two pounds of seed is needed to the acre. It is better to waste seed than not to have enough. In cutting out plants the poor ones can be killed. It matters little what soil the turnip is put in if it be rich and not too dry. If this drilled crop should chance to fail, the ground can be sown a little later to English turnips. A great advantage the turnip has is that it thrives best late in the fall when few other crops are growing, and can be harvested at any time before Christmas. The farmer who takes up turnip-raising intelligently and follows it systematically and persistently will surely make more with less work than by most other crops.

THE NITROGEN OF VEGETATION.

JOHN J. WILLIS, SUPERINTENDENT OF LAWES AND GILBERT'S EXPERIMENTAL FARM, ROTHAMSTED, ENGLAND.

A comprehensive and valuable treatise on the present position of the Sources of the Nitrogen of Vegetation, has been published by Sir J. B. Lawes, Bart., and Professor I. H. Gilbert, LL. D., in the Transactions of the Royal Society, England. The object of the paper as stated by the authors, is to summarize some of their own more recently published results, bearing on various aspects of the subject; to put on record additional results; to give a preliminary notice of new lines of inquiry, and to discuss the evidence so adduced with reference to the results and conclusions of others, which have recently been put forward.

EVIDENCE RELATING TO OTHER SOURCES THAN FREE NITROGEN.

In their earlier papers the authors had concluded that, excepting the small amount of combined nitrogen coming down in rain, and the minor aqueous deposits from the atmosphere, the source of the nitrogen of our crops was, substantially, the stores within the soil and subsoil, whether derived from previous accumulations, or from recent supplies by manure. More recently, it has been shown that the amount of nitrogen as nitric acid in the soil was much less after the growth of a crop than under corresponding conditions without a crop. In the case of graminaceous crops it was concluded that most if not the whole of this nitrogen was taken up as nitric acid. But with leguminous plants the evidence indicated that, in some cases the whole of the nitrogen had been taken up as nitric acid, but that in others that source seemed to be inadequate.

It was further shown that, under otherwise parallel conditions, there was very much more nitrogen as nitric acid in soils and subsoils, down to a depth of 108 inches where leguminous, than where graminaceous crops had for some time been grown, indicating that nitrification had been more active under the influence of the *Leguminosæ*.

ACTION OF ROOT-SAP.

In the course of investigation the question arose—whether roots, by virtue of their acid sap, might not, either directly take up, or at any rate attack and liberate for further change, the otherwise insoluble organic nitrogen of the subsoil. Accordingly, specimens of the deep, strong, fleshy root of the *Medicago sativa* (Lucerne) were collected and examined, when it was found that the sap was very strongly acid. But the manipulations in the laboratory not being comparable with those of the action of living roots on the soil, the results obtained did not justify any very definite conclusions as to whether the action of the roots on the soil, by virtue of their acid sap, is quantitatively an important source of the nitrogen of plants having an extended development of roots, of which the sap is strongly acid. Supposing, however, this to be the case, the question still remains, whether the amide substance thus rendered soluble is taken up as such, or undergoes further change before serving as food for the plant. Upon the whole it seems probable, that green-leaved plants can take up soluble nitrogenous organic bodies when these are presented to them under such conditions as in water culture experiments, and that they can transform them and appropriate their nitrogen. Thus, it is thought not improbable that they can take up and utilize amide bodies rendered soluble within the soil by the action of the root-sap.

INSOLUBLE ORGANIC NITROGEN.

In connection with the subject of the conditions under which the insoluble organic nitrogen of soils and subsoils may become available to chlorophyllous plants some results of Professor B. Frank are referred to. He observed that the feeding roots of certain trees were covered with a fungus, the threads of which forced themselves between the epidermal cells into the root itself, which in such cases had no hairs, but similar bodies were found external to the fungus mantle, which prolonged into threads among the particles of soil. The conclusions were, that the chlorophyllous tree acquires its soil nutriment through the agency of the fungus. Such a mode of accumulation by some green-leaved plants obviously allies them in this respect very closely to fungi themselves; and in view of the office within the soil which is by some attributed to micro-organisms and other low forms of plant-life, these observations are of considerable interest. It is stated that the development has not been noticed on the roots of any herbaceous plants.

EVIDENCE RELATING TO THE FIXATION OF FREE NITROGEN.

In the experiments of M. Berthelot, in all of which the grains of nitrogen are comparatively small, they have in some cases been attributed to electrical action and in others to the agency of micro-organisms within the soil. M. Berthelot first showed that free nitrogen was fixed by various organic compounds under the influence of the silent electric discharge at the ordinary temperature; and suggested that such actions probably take place in the air during storms, and when the atmosphere is charged with electricity, organic matters absorbing nitrogen and oxygen. The special interest attached to the fact is that by these means the free nitrogen of the air may be brought into combination within the plant.

Subsequently, he found that free nitrogen was brought into combination by argillaceous soils when exposed in their natural condition, and that there was also fixation due to living organisms. These gains of nitrogen not only serve as compensation for exhaustion by cropping, etc., but explain how originally sterile argillaceous soils eventually become vegetable molds.

From experiments of M. Joulie it was concluded that micro-organisms probably play an important part in the fixation of nitrogen. He did not think, however, that his results were favorable to the supposition that the plants themselves effected the fixation. Professor Frank considers that independently of direct evidence against the supposition that gains of nitrogen may be due to absorption of combined nitrogen from the atmosphere; an objection to such a view is that it would not explain the circulation of nitrogen in Nature; and his main conclusion is, that there are two actions going on within the soil, one liberating nitrogen, and the other bringing it into combination, the latter favored by vegetation.

The most remarkable of the results indicating the fixation of free nitrogen are stated to be those of Professor Hellriegel and Dr. Wilforth. Prof. Hellriegel found that while plants of the graminaceous, cheropodiaceous, polygonous, and cruciferous families required combined nitrogen to be supplied within the soil, papilionaceous plants did not depend on such soil supplies. Peas sometimes grew luxuriantly in washed sand with nutritive solutions free from nitrogen, but sometimes failed, root-nodules being developed coincidently with luxuriance, but not without it. At first, he was disposed to connect the action of nitrogen fixation with the root-nodules and their contents. Dr. Wilforth gave the results of a subsequent season's experiments, which fully confirmed those recorded by Hellriegal both as to the negative results with other plants, and to the positive results with *Papilionaceæ*. From which it was concluded that those plants can derive the whole of their nitrogen from the air, but that it is doubtful whether the root-nodules are connected with the fixation, though the results point to the agency of bacteria in some way.

CONCLUSIONS.

In reference to the foregoing results, Lawes and Gilbert say, while it can hardly be said that there is any unsolved problem in regard to the source of the nitrogen of other than our leguminous crops, it must be admitted that in spite of all the investigations and discussions of the last fifty years, the source of the whole of the nitrogen of these crops has not been satisfactorily explained by results obtained in the lines of inquiry until recently adopted. Evidence obtained on new lines should therefore receive careful consideration; and there can be no doubt that in recent years cumulative evidence has been adduced indicating that certain chlorophyllous plants may avail themselves of nitrogen brought into combination under the influence of lower organisms, the development and action of which would seem in some cases to be a coincident of the growth of the higher plants to be benefited. But such a conclusion is of such fundamental importance that further confirmation must yet be demanded before it can be considered to be fully established.

COTTAGE COSTING $1,000.

We present herewith a perspective view and floor plans of a rural or suburban cottage designed by E. H. Hammond, architect, New York city. The house is twenty-six feet six inches wide, and the same in length. The cellar extends under the whole house, with walls of field stone laid dry. The sills are six inches square; the plates and girders four by six inches; outside studding two by four inches; partition studding two by three inches; floor joists two by eight inches, sixteen inches apart from centers; rafters two by six inches, two feet apart from centers. The frame is first sheathed with hemlock boards, over which building paper is laid, and the whole covered with cedar shingles. These may be painted or stained any color desired. The first floor plan is clearly shown in Figure 2. The first story is eight-and-one-half feet high in the clear. The woodwork is of whitewood, filled, stained and polished. The walls and ceilings are lathed and plastered with one rough coat and a thin coat. The second story, of which the plan is shown in Figure 3, is eight feet high in the clear and finished in the same manner as the first story. Such a building could be put up complete in the vicinity of New York for $1,000.

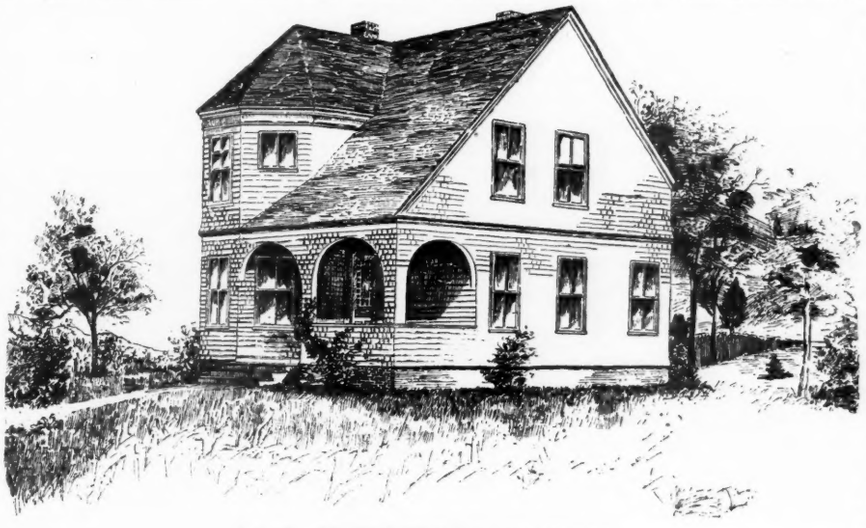


FIG. 1. PERSPECTIVE VIEW OF COTTAGE.

ORANGES VERSUS LAND BOOMS.

W. H. W. CAMPBELL, CALIFORNIA.

The people in the upper San Bernardino Valley have taken up a very sensible policy in view of the cessation of the "boom," or speculative real estate craze. While other towns on the Pacific coast are going wild over "booms" of their own, the settlers here are planting orange trees. The standard distance of orange planting hereabouts is twenty-five feet; some growers even favor thirty or thirty-five. In the Valentia orange groves, in Spain, the practice is twenty-five feet. About Nice, notably on the famous Bermond estate, trees grow from seventeen to twenty feet apart. It should be borne in mind, however, that water is scarce there, and manure is heavily applied. In South California it is a maxim that for doing its best the orange requires plenty of sun and plenty of water. Hence, foresighted orchardists give the trees ample space. They also keep the soil free of all plant growths, and practice pulverization with diligence. In the new orchards here many acres are set out in spaces of twenty feet. I was surprised the other day to hear an experienced orange grower quoted as advising this system, and at the first opportunity I asked him about it. He smiled grimly and replied: "For budded trees, you know; not seedlings." Now as nine-tenths of the trees put out are Navels, I said: "Then you must share the belief of those who call the Navel little better than a shrub, and likely to become a shy bearer." Another meaning smile, and this reply:

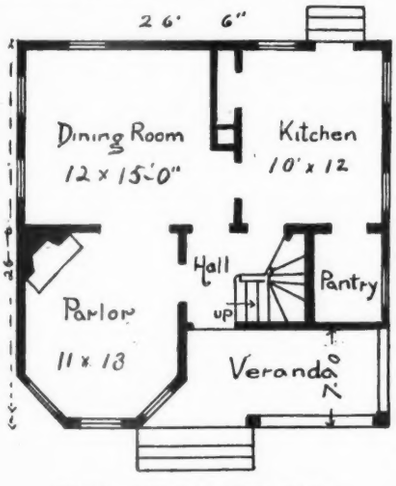


FIG. 2. PLAN OF FIRST FLOOR.

"No, the Navel, if budded high enough and old enough, on good stock, will make a tree and will bear heavily, especially"—with marked emphasis—"if people will have the courage to take the fruit all off for the first two bearing years." "Ah, I see! You base your advice on the average practice of the average planter." "That's it, precisely." And there is a good deal in it. The Navel boom has led to very early budding. I have known of cases where the earth had to be disturbed about the stock to insert the bud. The young tree is hustled forward into bearing, and is permitted to mature its fruit the first bearing year. Hence, you will see Navel trees, in some orchards, which are little better than shrubs, and these might perhaps as well be set one hundred to the acre as eighty. Here is another incident showing how practical advice has to be suited to the practice of the average fruit grower. "By no means manure your young orchard when planted out from the nursery!" This was the advice of the expert already mentioned, and it is the usual rule. Fancy the surprise of the advisee a few days later, when on visiting a new orchard of the advisor he discovered manure about the young trees. "How is this?" I asked him when next we met. "Well, you see the average man cannot be trusted to handle manure. If he digs it into the ground he burns up his trees. Now, I make a circular trench about my trees away from the trunk. I put old compost into it, and let the irrigating water carry it delicately down to the roots. This makes the little trees fairly jump, while raw manure or rash handling would hurt them." In point of fact this man has a wonderful success with orange trees; and the groves in this section giving the astounding yields which so amaze Eastern folks, owe it to scientific manuring in no small degree.

This reference to the hurrying forward of Navel trees suggests another point,—the selection of stock, which seems to have been very greatly overlooked. This valley abounds in seed beds, the bases of future groves. On the premises where I write there are perhaps 50,000 young trees in beds, and half as many more in nursery rows. Almost every thrifty family is doing something in the same line. Now, where do the seeds come from? Almost invariably from "culls," the oranges thrown out as thorn-pricked, wind-bruised, misshapen, scabby or in some way defective or undeveloped. Many of these culls, although some are excellent, are quite unfit for eating. Now here is a policy not at all conformed to that which usually prevails in the culture of choice cereals and flowers. Is it a proper or a wise one? Must not the result be stocks comparatively inferior? And the same system prevails in budding. The buds are too often selected at random, from every sort of twig, even suckers. In fact, it is charged that some professional budders are dishonest enough to take buds from the seedling stock; but this sort of fraud is probably exceptional. The question which bothers me is what the effect of such careless and unscientific stock selection is to be upon the orange groves of the future. It need hardly be added, however, that there are orchardists who proceed upon a sounder system. Let us hope their efforts will set up a standard of

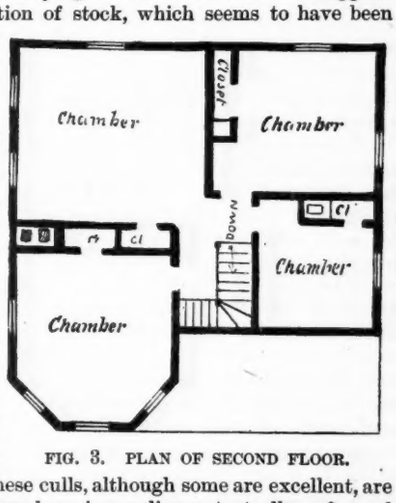


FIG. 3. PLAN OF SECOND FLOOR.

tree to which the careless and incompetent will in time be compelled to conform. Unless this happens, the reputation of California oranges may have to suffer.

Some careful observers of the habits of orange trees begin setting out young stock in February and March, when there is a period of dormancy. The old custom was, and indeed continues to-day, to set out later, say in May or June. Those who began the earlier planting were greeted with general pooh-poohing. But the trees thus planted are their own best argument. During the first summer the young stock is left free to push outside shoots, which are not rubbed off until the dormant period in February. The theory is that these side shoots develop little roots for their own support, which would not otherwise exist, and this theory is supported by actual observation.

In setting out young orange trees the theory is, dig deep. At the villa Bermond, near Nice, in France, the proprietor was discovered last year digging holes two metres in depth for a fresh orange grove. Place the earth from the bottom carefully by itself, and in filling the hole put the surface soil in first. No manure—subject to the theory already set forth in these notes. Experienced growers here believe in planting out seedlings, and budding with selected buds not earlier than the third year. In fact I have seen a bud set in the fifth year which had quite outstripped in size and vigor buds in neighboring trees set the third year. Yet the general practice hereabouts seems to be to plant out budded trees. In the haste for early results, the policies best adapted for prosperity in the long run are not kept keenly in view.

PAPER AS A NON-CONDUCTOR.

L. B. PIERCE, OHIO.

The advantages arising from the use of non-conducting walls for dwellings, cellars, cold storage warehouses, silos, etc., are not nearly as well understood as they should be. Of all the materials used in building, wood is the best and brick the next best non-conductor, while thick paper is useful in combination with other materials, from its air-tight qualities and great pliability. Wooden boxes of flowers and plants lined with thick paper are shipped thousands of miles in the dead of winter, and sometimes carried in a wagon for an hour in a zero temperature without injuring the contents. I once shipped a lot of apples in dry-goods boxes to Columbus, a distance of 140 miles. The railroad agent promised that the fruit should reach its destination the following day, but it was near the holidays, and I took the precaution to line the boxes with newspaper. The weather suddenly turned cold; the freight, through some carelessness, was carried 300 miles out of the way, and reached its destination fourteen days after shipment, with the thermometer 4° below zero. Yet the apples were not frozen except a few around a knot-hole, where the paper was broken. Having occasion last winter to deliver a few bushels of apples in a cold day, I put them in paper flour sacks and allowed them to stand several hours in a warm room. They were then carried two hours in an open sleigh, with the temperature at 14° above zero, without freezing, and could doubtless have been carried two hours longer without injury. Being in a temperature of 70° when taken out, it took a long time to reduce this to 27° (the temperature at which apples freeze), protected as they were by the impenetrable walls of the paper sacks.

In building, the value of paper for excluding cold may be overestimated. Two thicknesses of boards, with a thickness of building paper between, is not sufficient siding for a greenhouse. My own experience is that without other aid, such a wall affords insufficient protection from long-continued cold. Its efficiency will be quadrupled by the addition of a dead-air space. Examples can be found in nearly every village to prove this. Homes are built, enclosed with sheathing paper and siding, and then used a year or two before the builder feels able to lath and plaster. After the plastering is completed and the joints ceiled, with the moldings covering all joints and forming a dead-air space between the studding, the rooms can be warmed, and kept so, with about half the fuel needed before.

In the care of a silo the matter of heat and cold is not as important as that of exclusion of the air, as the ensilage affords sufficient internal heat to carry it through the coldest part of winter without extraordinary precautions. For this reason two thicknesses of boards, separated by firm, close-grained paper, is sufficient, and, owing to the wet nature of the contents, it has been found that matched lumber is of no special advantage, as the matching warps out. In other cases, as of cold storage and greenhouses, it pays to use matched boards, as a good, tight, dry board is an excellent non-conductor, and it is of no advantage to have a yawning open crack once in ten or twelve inches, although statements are seen in newspapers that rough, unmatched lumber is as good as any, as the paper is expected to make it duly non-conductive. If a stocking full of holes is as good as a whole one, then a sheathing with yawning cracks and knot-holes is as good as a tight one.

Where cellars are under an unwarmed part of the house, it is often difficult to keep them warm, even when banked. The cold comes through the floor overhead. Ceiling the under side of the joints with matched lumber will often remedy the difficulty. Many dollars could be annually saved in stables if they were lined with building paper, kept in position and protected with a lining of boards. The boards need not be more than half an inch thick, but should be well seasoned and the edges matched. Two half-inch boards with paper between make an excellent partition between a stable and a carriage-house, keeping the stable warm and the carriage room free of ammonia, so destructive to paint and varnish.

MARVELOUS VALUE OF THE COTTON PLANT.

DICK NAYLOR, TEXAS.

In his speech at the Dallas (Tex.) fair last October, Mr. W. H. Grady estimated the cotton crop of 1888 at eight millions of bales, which at $40 per bale of 500 pounds, or eight cents per pound, is worth the total sum of $320,000,000. But this sum does not cover the full value of our cotton crop, as Mr. Grady further demonstrated. He said: "Its seed will yield $60,000,000 worth of oil, and $40,000,000 in food for soil or beast. * * And now, under the Tompkins patent, from the stalk newspaper is to be made at two cents per pound." So it seems that our great Southern staple is not only holding its own as a prime factor in the world's commerce, but is increasing in importance, or at least the present plant is. Mr. Grady quotes Edward Atkinson as saying: "If New England could grow the cotton plant without lint, it would make her richest crop. If she had monopoly of cotton lint and seed, she would control the commerce of the world." From the above, it appears that the royal title of "king" as applied to the cotton plant, is not inappropriate. Just think of the seed alone being worth one hundred millions of dollars to the South! I doubt not these figures could be doubled, if the entire seed crop of the Southern States should be properly utilized. The practice of burning cotton seed for fuel in steam furnaces in many portions of our prairie country is not yet abandoned. In localities where wood is scarce, steam gins are often run almost entirely by cotton seed fuel. Many thousands of bushels, too, are wasted by pure neglect, being allowed to scatter and rot about the gins, where they do no good. If all the seed thus wasted and burned for fuel were fed to cattle and the cattle's manure saved and applied to our fields, the monetary value of the cotton seed crop would be largely enhanced. In view of the great demand brought about by the jute bagging trust monopoly for a new and cheaper bagging, we have much reason to hope for a great development of the value of cotton stalk bark. The tensile strength of this fiber is well known to cotton raisers, and has at last attracted some attention as a suitable material for coarse bagging. Let us hope that ere long its manufacture into this article and for paper-making purposes may add another bright gem to the glittering, snowy crown of "King Cotton."

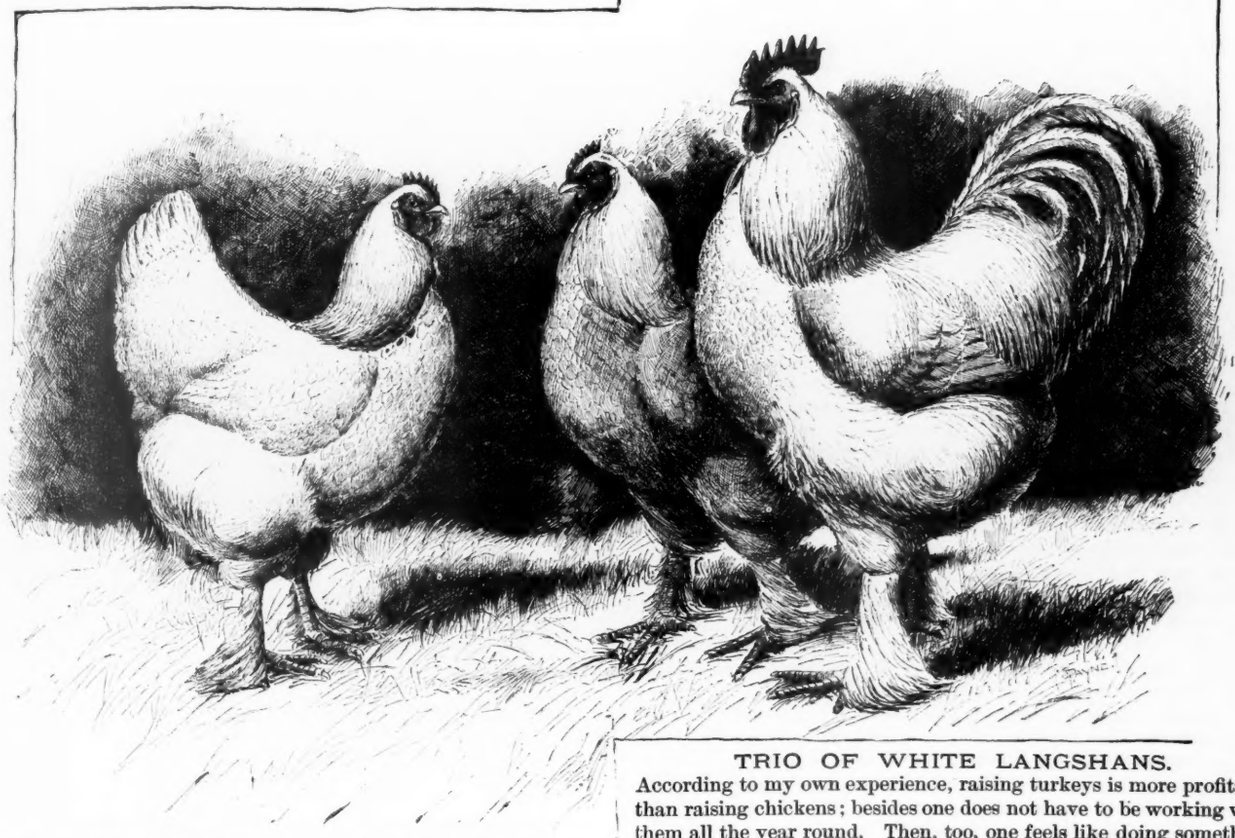
Pasturage.—It is important that this be properly chosen, especially for growing colts. If this is on very rich land, or watery, the grass will be too rank for the growth of fine, strong bones, and firm, enduring muscle. Colts grown up on such will be pretty sure to be wanting in spirit, slow of movement and deficient in wind, so much so that when in harness if put up to a moderately fast pace—which can only be done by a repeated application of the whip—they breathe painfully, sweat intolerably and soon tire. The best pasture ground for colts is such as is well drained, or naturally rather dry, and if it abounds with scattered rocks a foot or more in diameter, these are not objectionable, but small stones are, for the colts in running about are liable to strike on them to the injury of their hoofs, while they avoid the larger ones and rocks in their exercise. The grass on such lands is sweet and tender, highly relished by the colts, and very nutritious. Growing up on such, especially if limited to it; the feet and legs and the bones of the whole body become extra strong, more like ivory than common bone grown on quite succulent pasture. For cattle the pasture need not be so select in quality, for they will do well on wet meadows when the water is generally a little below the surface of the soil, only occasionally overflowing for a few hours and then drying off well.

WHITE LANGSHAN FOWLS.

The white Langshans, a trio of which is shown in the accompanying engraving, are the latest and rarest acquisition to the breeds of American poultry. The white Langshans originated in California with a gentleman who had for several years been a leading breeder of the black variety. In 1882 two chicks hatched from eggs of black Langshans were blueish white and canary, and as they attained maturity became pure white. Last year a pure white hen was imported from the Province of Langshan, China, and added to the flock which had been raised from the white "sports." Other similar importations have been made to California which, together with the natural increase, has multiplied the white Langshans to some extent, though they are still very scarce and rare.

When first hatched the chicks are a blueish white on the back, with throat and breast white and canary. When fully matured the plumage is pure, spotless white, legs blueish slate with vivid pink showing through. The feet are bright pink, the combs, ear-lobes and wattles vivid red. The combination of colors is remarkably handsome. In their general characteristics they are identical with the black Langshans.

As may well be supposed, a breed so rare and handsome possesses a fancy value, and unscrupulous persons are found ready to speculate on the popularity of the new breed by selling spurious specimens. A circular has been issued by George T. Marsh, secretary of the California Poultry Association, warning the public against impositions of the kind. He says: "The so-called white Langshans that are offered for sale by some irresponsible persons have little or no pure Langshan blood in them, and their sale threatens to corrupt the purity of this coming breed." A. A. Halliday, secretary of the American Langshan Club, writes to us as follows: "The true white Langshans are very scarce as yet; probably there are not more than fifty birds in America. They breed true to color and markings, if kept strictly pure, and will be admitted to the standard at the next meeting of the A. P. Association. A man in Pennsylvania claims to have bred from 'sports' over six hundred of these fowls. But at the great International show in Buffalo, N. Y., last winter, all the birds he exhibited as white Langshans were thrown out for yellow feet and skin. My attention was called to them by an officer of the society, and I saw at once that they were mongrels. The white Langshan promises to become very popular, and it would be a pity to have the purity of the breed stained by mixture with mongrels at the start."



TRIO OF WHITE LANGSHANS.

TURKEY-RAISING FOR BOYS AND GIRLS.

MISS H. C. DUDLEY, KENTUCKY.

Turkeys are more interesting than chickens. They have sufficient intelligence to enable you to train them to do certain things at certain times. They have affectionate dispositions; the little ones, I know, love me when I go to feed them, and their stately old mothers do not disdain to take a morsel from my fingers now and then. But the old gobbler, I fear, cherishes a life-long grudge against me for turning him out of the yard when I go to feed the hens. He has grown so fat and clumsy that there is danger of his falling out of the tree some night and killing himself. So I am trying to persuade him to reduce himself. Turkeys are more observing than chickens. Mine make a great ado over me when I "dress up," and when Flora, my little colored helper, got a blue toboggan cap last winter, the whole flock followed after her and gobbled in the most appreciative manner. Flora was delighted with these demonstrations because they attracted attention to her new cap.

According to my own experience, raising turkeys is more profitable than raising chickens; besides one does not have to be working with them all the year round. Then, too, one feels like doing something worth while when taking a trembling, helpless little poult, that can be held in the hollow of the hand, and raising him up to be an immense bird that will perhaps weigh when grown, forty-five pounds. In winter, a turkey of moderate size will last our small family a week. It is roasted for the first dinner, sliced cold for the second, a leg barbecued with vinegar for breakfast, hashes and stews innumerable, winding up finally with a bowl of delicious soup made from the bones.

When one lives on a farm where the turkeys can have an extensive range, there is no difficulty in keeping them healthy, and if in reach of a good market, there is no reason why there should not be considerable profit in turkey-raising. Even here in the country, a hundred miles distant from a city, we manage to make it worth our while. Besides the profits which accrue from turkey-raising, many of our farmers actually declare that a flock of moderate size is a benefit to the farm on account of their destroying myriads of insects that infest the fields during summer.

During March the hens must be carefully watched, as their wild nature then asserts itself, and each one wanders off alone in a different direction in search of some secluded spot for her nest. In

May and June they are sitting and hatching. For some weeks after the young turkeys come off, they need to be closely looked after to prevent their running their silly little heads into all sorts of dangers. If a shower comes up, you must rush out and get them up, else you may find after it only a heap of drowned little poults, with their disconsolate mother standing over them, regretful, let us hope, that she had not chosen some other place than the ditch in which to hover them. A turkey hen is very whimsical in many respects; she will never go into her coop at night unless compelled to. Mine will bring up their little flocks to be fed at sundown, but as soon as they are satisfied the watchful mother calls them off with a few well-understood yelps, and hides them in the highest grass accessible, where, if it were not for her curiosity she might sit undisturbed till morning. But she is so anxious to watch me that she keeps stretching up her long neck now and then so I catch a glimpse of her red head and go after her. When at length the young brood is

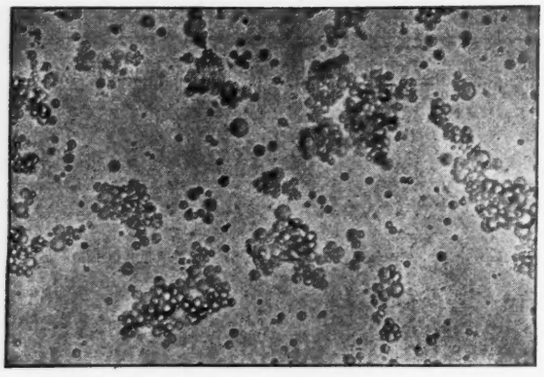


FIG. 1. NORMAL MILK.

old enough to be permitted to roost out of doors, then how perfectly delighted they are! At first the whole flock comes home an hour or two earlier in the evening in order to arrange themselves to their satisfaction on the roost-pole. The mother stations herself in the center and stretches out her wings to their fullest extent, for although the little fellows are mannish enough to want to go to roost, they are still babyish enough to desire the warmth and protection of their mother's soft feathers. When turkeys can have an extensive range they need but little food at this age, in addition to the insects which they are catching all day long in the fields and meadows, only a light supper at night to bring them home. Sometimes, though, they extend their grasshopper hunt so far that when it catches them they are nearer a neighbor's house than their own, so they go over and spend the night. This propensity for visiting should be nipped in the bud; if the flock is not in sight at sundown, their owner should look for them until they are found.

In the fall the flock has increased in size, while their appetites are truly appalling. One can form some idea of the quantity of grass and insects which they consume by the quantity of food that they demand when this supply is exhausted. If it is desired to get them ready for Thanksgiving, they should be liberally fed for about two months before, in order to hasten development, so that their bodies instead of being covered with pin-feathers will present in market a smooth, rounded, and plump appearance. There is nothing more unattractive than a skinny, raw-boned turkey, and no sight more appetizing than one that is fat, shapely and symmetrical, with its yellow fat shining through its clear skin.

If the stock is pure-bred the largest and handsomest should be kept for breeding purposes, and these should not be fattened, but simply kept in good condition, favorable to healthy growth and development.

A Cheap Plant Protector.—To keep bugs away from melons, frost from tender plants, the sun from cauliflower, etc., cut barrel hoops into pieces sixteen inches long, crossing them in the center and fastening together with a small wire nail. Then cover this frame with light muslin, leaving an inch at the end of each stick exposed, so they may be pushed into the ground, thus drawing the cloth close to the ground at the edges. This frame, being flexible, can be adjusted to a greater or less spread, as desired.

The Genuine Kerosene Emulsion.— Prof. C. V. Riley, entomologist to the United States Department of Agriculture, complains that several journals have published as his an incorrect formula of the emulsion which a few years ago he proposed as the most generally useful insecticide. The correct formula is as follows: Gradually add to kerosene half as much milk, stirring thoroughly until the two are perfectly combined and no drops of oil are to be seen, and a complete emulsion is formed. For use, one part of this emulsion or mixture is added to twelve parts of water, and thoroughly stirred. This is the usual strength, but if a stronger preparation is required, use less water. The emulsion is applied by means of a garden syringe or a garden engine. It is of more importance to diffuse such application evenly than to apply a large quantity. More attention should be paid to the character of the nozzle that distributes the liquid. Some of the "spraying" nozzles are most effective.

COMPOSITION OF MILK.*

S. M. BABCOCK, WISCONSIN.

Milk when fresh is a thin emulsion of butter fat, in a watery solution of albuminous matter, milk sugar and mineral matter. Under the microscope it appears to be a clear liquid in which is suspended an immense number of small fat globules that are more or less collected into groups (see Fig. 1). These globules vary considerably in size; the smallest being about one ten-thousandth of an inch in diameter and the largest about one two-thousandth of an inch. The average diameter for cows' milk is about one five-thousandth of an inch. The size of globules varies considerably with different cows and with different breeds. It is characteristic of the fat globules of Jersey and Guernsey milk to be large and quite uniform in size; of the Ayrshires to be small and variable, while the Holstein globules are small but quite uniform in size. The number of globules in a given volume of milk varies greatly according to their size, and to the per cent of fat. An average number would be about 2,000,000,000,000 in one quart.

Milk containing large globules will cream more rapidly and efficiently than milk with small globules. Uniformity in the size of globules is also desirable, as globules of the same size will reach the surface in about the same time. The average composition of cows' milk is approximately as follows:

		PER CENT.
Fat		3.5
Milk Serum	Nitrogenous matter, (casein, albumen, etc.)	4.3
	Milk sugar	4.5
	Ash	.7
	Water	87.0
		100

Numerous tests made at this Station by adding about one-tenth per cent of caustic soda to the milk and setting it in a warm place for twelve hours, show that such milk creams very rapidly and efficiently, the skim-milk containing on the average less than .2 per cent of fat, while milk to which nothing was added gave skim-milk that contained from .5 to one per cent of fat. In general the alkaline milks gave only about one-third as much fat in the skim-

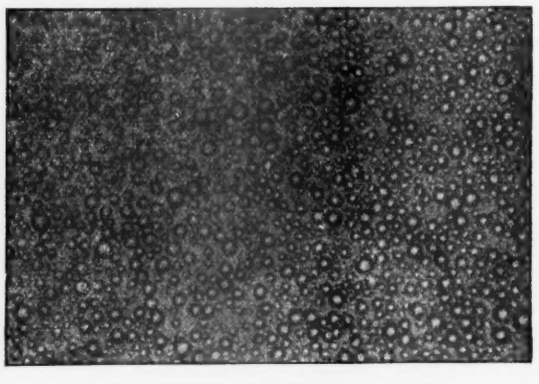


FIG. 2. MILK TO WHICH CAUSTIC SODA HAS BEEN ADDED.

milk as did the others. Moreover, the fat recovered in the butter was greater where the alkali was used than where it was not. As the viscosity of the milk serum was greatly increased by the alkali, the best explanation of the thorough creaming is that the alkali prevented the clotting of the fibrin. That it had this effect is shown by a microscopical examination of the alkaline milk, as the globules of such milk are more evenly distributed, and not grouped as in the natural milk. (See Figs. 1 and 2.)

Experiments have been made by setting milk in cans the diameter of which varied from one inch to about 8½ inches in diameter. The cans were all filled to a depth of eighteen inches and placed in

*Condensed from Bulletin No. 18 of the Wisconsin Agricultural Experiment Station.

ice-water for the same length of time. They were skimmed by drawing three-fourths of the milk from the bottom of the can. This skim-milk was analyzed with the results given below:

PERCENTAGES OF FAT IN SKIM-MILK FROM DIFFERENT-SIZED CANS.

DIAMETER OF CAN.	1 in.	2 in.	3 in.	5 in.	8½ in
1st trial, fat per cent	.85	.34	.27	.28	.31
2d trial	.48	.30	.33	.28	.22
3d trial, five hours	...	.70	.70	.75	...
Average of first two	.66	.32	.30	.28	.27

These results show apparently no difference in the efficiency of the creaming between tubes 2 in. and 8½ in. in diameter, as they are all within the limits of error of analysis.

CONCLUSIONS.

1st. That milk when fresh is a perfect emulsion, the fat globules being free and without an envelope.

2d. That the chief differences in the composition of normal milks are due to variations in the amount of fat, the remainder of the milk, known as the milk serum, being quite uniform in composition in all milks. The variation in the amount of serum solids in milk from the same cow is rarely more than one-half per cent, in milk from different cows of the same breed is usually less than one per cent, and in milk from cows of different breeds not more than two-and-one-half per cent. This holds true even when the fat varies as much as seven or eight per cent.

3d. That milk contains a principle analogous to, or identical with blood fibrin, which is capable of spontaneous coagulation, the clots of which entangle the fat globules and to a considerable extent prevent an efficient creaming.

4th. That the most efficient creaming is obtained when conditions are supplied which retard or prevent the coagulation of fibrin. This may, in practice, be best accomplished by setting the milk directly after milking in cold water (ice-water is best), the creaming vessel to be of bright tin or other metal that can easily be kept clean.

5th. When the milk is transported or when for any reason the setting must be delayed, no method of creaming gives as satisfactory results as the centrifugal.

FARMERS' AND LABORERS' UNION OF AMERICA.

What promises to be a successful coalition of the principal new agricultural organizations in the West and South is now under way. The representatives of these organizations convened at Meridian,

EVAN JONES, PRESIDENT.

Miss., in December last, and perfected a plan of co-operation and consolidation. They established a new national organization with the above name, adopting by-laws and constitution, and electing officers for the ensuing year. This new constitution has already been ratified by several of the State organizations, and it is safe to say that before the next annual meeting of the new Farmers' and Laborers' Union of America, the consolidation will have been accepted by more than the three-fourths majority required. The next

A. E. GARDNER, SECRETARY.

meeting is to be held at St. Louis, Mo., on the first Tuesday in December, 1889. The President of the temporary organization is Evan Jones, of Dublin, Texas; Vice-President, Isaac McCracken, of Ozone, Ark.; Secretary, A. E. Gardner, Dresden, Tenn.; Treasurer, Linn Tanner, Cheneyville, La.; Chaplain, J. D. Satterwhite, Bonne Terre, Mo.; Steward, G. L. Clark, Stephenville, Texas; Doorkeeper, F. G. Blood, Marion, Ill. The members of the contributing organizations are claimed to number one and one-half million farmers exclusive of women and children. These organizations embrace the following:

National Farmers' Alliance and Co-operative Union of America—President, C. W. McCune, Washington, D. C.; Secretary, E. B. Warren, Dallas, Texas.

National Agricultural Wheel—President, Isaac McCracken, Ozone, Ark.; Secretary, A. E. Gardner, Dresden, Tenn.

National Farmers' Alliance of the Northwest—President, J. Burrows, Filley, Neb.; Secretary, August Post, Moulton, Ia.

Farmers' Mutual Benefit Association—President, F. G. Blood, Marion, Ill.; Secretary, A. M. Palmer, Marion, Ill.

Under the new constitution these different organizations are to be merged into the Farmers' and Laborers' Union of America, with local, county and State organizations subordinate to the National. The State bodies are to be governed by the National order, but the new constitution guarantees State rights and retains about the same relation between the National and State organizations as exists between the respective States and the Federal Government. President Jones, who is also president of the Farmers' State Alliance of Texas, says: "We are not organized for the purpose of antagonizing any legitimate business, profession or calling. We realize the fact that in the general make-up of the running machinery of our government there are three distinct partners—Land, Labor and Capital, and that either one is essential to the prosperity of the others. In other words, Labor, co-operating with Land, assists Nature in bringing forth and perfecting the products of Mother Earth, and then, by distributing these products, creates wealth. Capital in turn pays labor for its services. Hence, if there is a just distribution of the wealth created from the earth, all three of these partners will prosper. If there is an unjust or unequal distribution, one—either Land, Labor or Capital—will grow rich and powerful, while the others will become poor and weak. The members of this organization realize the fact that the agriculturists are not getting their just share of the wealth they create, and hence are organizing,—not to oppress anyone, but through a well-defined system of organization,

education and co-operation, to regain control of their produce, so that we may be able to obtain legitimate prices for both produce and labor."

It will be seen that the scheme of organization is representative and in many respects similar to the Grange or Patrons of Husbandry, except that not the same prominence nor equality is given to women, while the social features which have made the Grange so successful are not equally emphasized in the new Union. It is a less expensive organization than the Grange, the admission fee as well as the regular annual dues being lower. But there are essentially the same restrictions as to admitting members. The Union, however, goes further than the Grange, and admits laboring men as well as farmers, the Grange being confined solely to farmers and their families. The various organizations of which the Farmers' and Laborers' Union of America is composed have already done a vast amount of good during their brief existence and rapid growth, although they have suffered in many respects from the same mistakes that characterized the mushroom growth of the Patrons of Husbandry in the early days of that organization. We regard this effort at a combined national organization as the first step toward effecting a more efficient, more strict and systematic organization. There is no reason why the bodies named should not unite, and there is everything to be gained from such a union of forces if they propose to be thoroughly drilled and are all to work harmoniously together. The Grange, while heartily in sympathy with the new movement, has not yet affiliated with it, as its members believe that the Patrons of Husbandry have a more efficient system of organization and one that will be more durable.

THE MARKET GARDEN IN JULY.

JAMES K. REEVE, OHIO.

This month should be one of the busiest of the year in the market garden. Not only are the green crops at their height, but fall crops are beginning to mature; the land from which the first crops have been sold is to be cleared, and winter crops are to be planted.

If the winter onions are ready to harvest, as they may be by the end of the month, and which may be known by the tops dying and falling over, pull them by hand when the ground is perfectly dry, throwing two or three rows together into one. Leave them exposed to the sun at least three days, stirring frequently that all may become well dried, before putting under cover. Sort out such as are too small for market, and store separately to use for sets for the first planting next spring. Store the onions in a dry, airy place, and not in piles of any great bulk. Yellow Danvers and Red Wethersfield may be safely kept until spring, but unless storage conditions are exceptionally favorable, the white onions should be disposed of by November.

One of the important crops to watch and cultivate carefully through the heat and droughts of midsummer, is the late cabbage. To make good heads cabbages must be kept steadily growing. Keep the entire surface of the soil about them loose and fine, and run the cultivator deep in the center of the rows. If not thoroughly worked during a dry spell they may commence to head up before having completed their growth. Heavy rains will then start them up again and an almost worthless crop of split heads will be the result. If the tendency to split is noticeable, go over the piece and start the roots partially loose from the soil. This will check the rapidity of the new growth and give the plant time to adjust itself to the altered circumstances.

An important item of the work for July will be to prepare the ground for, and to sow turnip seed. There are two classes of farmers who usually fail to find any profit in this crop. The first comprises those who think that turnips don't amount to much anyhow, and won't repay the expense of much labor incurred in putting in. So to make amends for the short crop which experience has taught them to expect, they plow up two or three times as much land as is necessary, and scatter a superabundance of seed upon it, because the seed is cheap, without much attention to a regular distribution. The result is, many spots entirely bare, and others overcrowded with plants. The crop fulfills expectations by not paying, because more land has been used than the result justifies. The second class consists of those who think turnips will grow anyway, and their method of procedure is almost the same. The soil is barely scratched with a plow, harrowed as little as possible, and the seed sown thereon to shift for existence as best it may. If a moderate crop results, the grower is satisfied. If the crop fails to come, he lays it to poor seed.

Owing to the season at which they are planted, a season when we may expect drought instead of showers, and when the heat of the sun is so great that it dries up both soil and seed instead of warming it into life, the greatest care should be exercised in the initial preparations. The practical market-gardener, who knows that a good turnip crop means a daily addition to his sales, steadily from September until April, selects ground from which some hoed crop, such as potatoes or early cabbage, has been removed, as such ground is apt to be mellower and cleaner than any other. He plows this deep, and harrows until it can be no finer; on this surface the seed is sown at once, without waiting for rain or the indication of rain. The fresh-turned earth is a better factor for starting germination than a rain would be, unless it were just such a soft, gentle rain as we would always have if we could, but which in fact comes so seldom. The seed should be covered in with a good brush harrow that will leave some of the fine soil over it as well as under.

In the early fall months some of the vegetables that sold well early in the season prove attractive. Lettuce should be sown this month, and the crisp, green leaves will prove palatable when cool days come again. Peas also should be sown, to keep the supply up until the beginning of winter. Use the early sorts now, and sprout them slightly by mixing with fine, moist soil a few days before planting. Little trouble will then be experienced in getting them started, and in growing a good crop, if the requisite conditions of well-prepared ground have been complied with.

Experiments with Cabbage Plants.—I have come to the conclusion this season that cabbage plants may be set in the open ground, to advantage, much earlier than is customary. In the latter part of March, the ground being in fine condition and pleasant weather prevailing for some time, I took a few plants from a cold frame and set them out. In a few days a hard freeze came, the mercury going down to twenty-four degrees Fahrenheit. My plants shivered and looked blue, but revived with the warmer weather and now are decidedly ahead of those set later from the same frame. Possibly the later set plants would have done quite as well, but unprecedentedly dry weather, for the season, followed their planting. The earliest ones had the benefit of all the moisture that departing winter left in the soil. In my first regular planting of early cabbage this season, I tested carefully the relative value of small and large plants. Under equal conditions as to soil, moisture, time of planting, etc., I put out a quantity of fine, stocky plants averaging six inches in height. Beside them I set an equal quantity of small plants, none more than three inches high. At this writing all are flourishing, but if there is any choice between them it is certainly in favor of the piece set with the smaller plants. K. R. JAMES.

The Rose Bug is a hard insect to fight, and we have had no practical occasion to experiment with it in the work of the Botanical Division of the United States Department of Agriculture. The old method was to knock the insect from the foliage or fruit into a pan of kerosene and water. This, however, is very slow work and not practicable on a large scale. At River Edge, N. J., they found last season that a mixture of pyrethrum and water made a very excellent liquid to spray upon the vines. It destroyed all of the insects which it touched and seemed also to have a preventive action. The proper proportions can only be obtained by further experiment. Col. Pearson, of New Jersey, has also found that the original fungicide mixture of sulphide of copper and lime and water sprayed upon grape vines has both a poisoning and deterring effect upon the rose bug. This insect is one which I hope to have a good series of experiments made upon with a view of determining just what is best to be done. PROF. C. V. RILEY.

How to Build a Greenhouse Wall.—As a matter of economy and permanency, all greenhouse walls should be built of locust posts to which are nailed first rough planking, then against which is tacked roofing or other paper used for lining; against that again are nailed the ordinary weather boards as a finish. A wall built in this way will last for twenty-five years except perhaps to renew the lower board, and in our experience we consider it a greater protection against frost than an eight-inch brick wall. In any of the Northern or Eastern States, where the thermometer remains for any length of time below zero, an eight-inch brick wall will not stand, if raised even four feet above ground, for greenhouse work. The moisture inside of the greenhouse, together with the high temperature, begets a warfare with the zero weather outside so that in a year or two the eight-inch greenhouse wall gets completely broken up, and has to be re-built. PETER HENDERSON.

FARMING AMONG THE PUEBLO INDIANS.

RALPH S. TARR, NEW MEXICO.

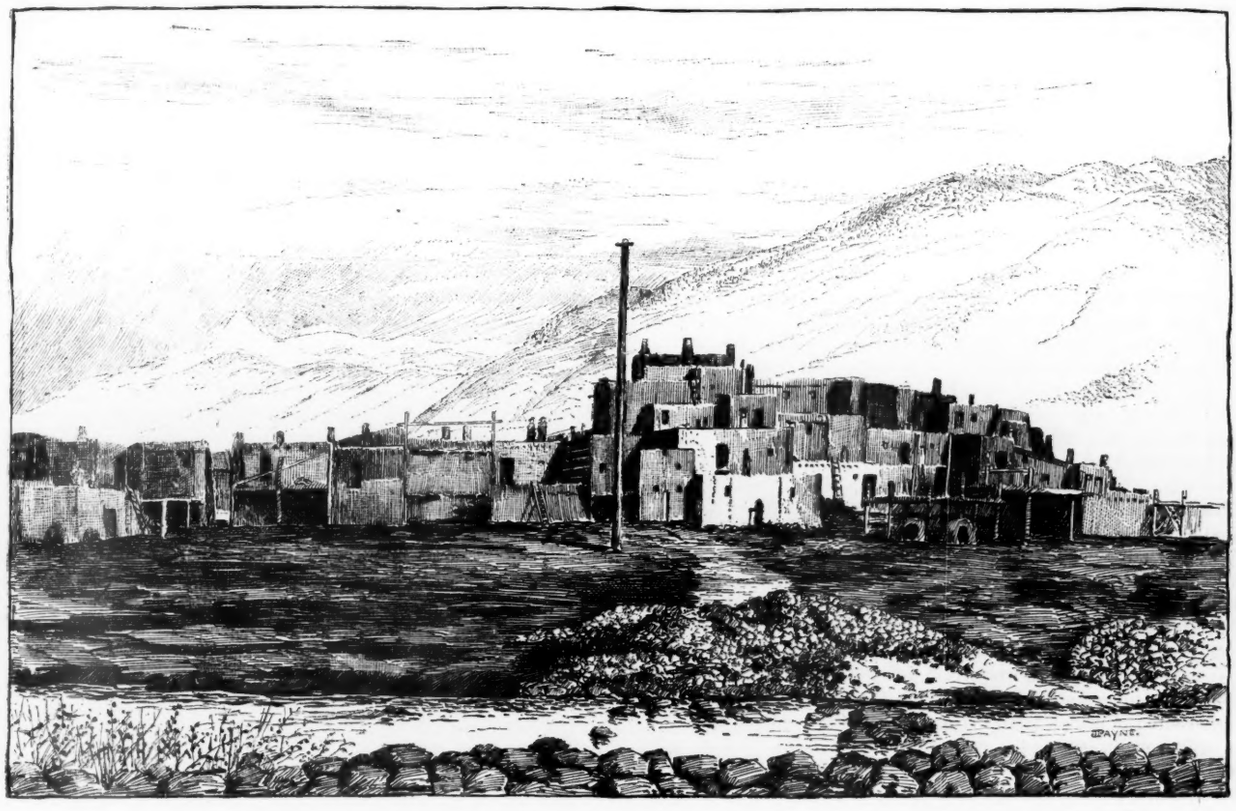
More than three hundred years ago, the Spaniards passing up the valley of the Rio Grande in New Mexico found many populous villages inhabited by Indians. These villages were not like the ordinary Indian settlements, there to-day and a score of miles distant to-morrow. They were permanently inhabited towns, and the inhabitants were more than semi-civilized. They showed many traces of Old World civilization, one of the main of these being the art of farming by irrigation.

The country was extremely arid, like many of the Asiatic and European countries, and agriculture without irrigation was an impossibility. Cactus, mesquite and the dry gramma grass abounded, but few other kinds of vegetation were possible. In places along the banks of the rivers an abundance of water could be utilized by the agriculturist, and this the Pueblos did. These Indians dammed the rivers, took out the water and led it long distances to their agricultural land, and then utilized it for farming on the otherwise desert soil. These undertakings often required a vast amount of skill, patience and labor. In places they cut canals in solid rocks, again the ditches were carried around great hills and through deep cañons, and for all this they had only stone implements.

The Spaniards who conquered this New Mexican country were fearless and thoroughly unscrupulous. Not knowing where they were going and having but one object, the search for gold, they travelled thousands of miles from the Gulf of Mexico to the Missouri river. They took every opportunity to fight and murder the offenseless natives. It was not long before this state of affairs ended in the complete submission of the Indians to a state of slavery. For awhile they were used to work in the mines, being kept beneath ground often for months at a time. Afterward they were "peons" to the Spanish farmers who had become convinced of the scarcity of gold, and finally they and their half-breed descendants lapsed into a semi-civilized state and lived by farming on the old original Pueblo Indian style with some few Spanish innovations.

It is this way that we find them to-day. There are in New Mexico large tracts of country where progress has never entered. For three hundred years of historic time and many centuries of pre-historic time, a crude and primitive state of agriculture has existed. Many of the Mexicans are half-breed Pueblo Indians. They have left their tribes, and farm in communities by themselves, but there are also many tribes of Pueblo Indians still in existence, retaining many of their pristine habits. In New Mexico there are, I believe, nineteen Pueblos and seven different dialects, but all speak the Spanish language as a common dialect. They live in communities, with their houses clustered as close together as possible. Indeed, in somde cases, as at Taos, as seen in the accompanying picture, engraved after a photograph, the houses not only join one another but are built one on top of the other. The houses are built entirely of sundried clay with brush and mud roofs and mud floors. One room is generally enough for a family, and it is close, uncomfortable and extremely unhealthful. There are rarely any windows and very few doors. The entrance is generally through the roof by a ladder. In the pile of mud houses shown in the accompanying engraving several hundred Indians live. Few of them speak the English language and none have any American customs. Their dress is of the true Indian type.

The Mexican government granted to these Pueblos each a certain tract of land surrounding their farm; and our government has confirmed the grants. These were colonial grants,—that is, the land is owned in common and each man is given a small tract of land for his life share, which he can rent out if he chooses, but cannot sell. Whenever a man is married the governor of the Pueblos allots to him two or three acres of land, which is his until death. The ditch which conveys water to the land is common property and each man is required to do his proportionate share of work to keep it in order. All laws concerning the government of the people and the water right are made and executed by members of the tribe elected for that purpose. They are, however, all subject to United States and Territorial laws.



PUEBLO INDIAN COMMUNITY AT TAOS, NEW MEXICO

In farming, though several centuries behind the times, they are very successful. The forked stick for a plow is used by many of the Taos Indians within a few miles of the Colorado line. The ground is never plowed; it is merely scratched. The work between the times of plowing and harvesting is all done with a hoe. Harvesting is done with a hand sickle and threshing by goats. Wheat, corn and oats are the staple crops, and few, if any, trees or vines are planted. The Indians live from hand to mouth, obtaining each year enough for the winter, just as do the bees and ants. No thought is given to the morrow, and they are happy, contented, good-natured and peaceable, just as they have been for ages.

It is a source of wonderment how these people ever came here and how they came to be what they are. Are they people who

have advanced out of a state of barbarism, or are they the only ones among all the North American Indians who have retained traces of an early civilization? This latter supposition seems to me the most reasonable. In the making of pottery they are quite advanced. Their brothers, the Aztecs, had a wonderful state of civilization. The building of houses in itself is more than we can expect from an entirely savage race in a climate and country where houses are a luxury rather than a necessity. All these things lead me to think that they have retained civilization while their brother Indians have taken to the more fascinating life of the nomad.

There are numerous evidences that the Pueblo civilization at one time extended much farther than at present. The warlike, wandering tribes, preyed upon them and drove them little by little into a narrower compass. Their very houses tell this story of constant danger and invasion. The absence of windows and doors in the house cluster is for protection; and the habit having settled upon them they seem to be unable to give it up. In former times they had storage houses and places for final retreat in cliff caves, the ruins of which may be seen all about in this country. They are, I think, on the road to extermination. The Spaniards have left us but few, and these small bands, by close intermarriage, and the ravages of small pox and other diseases brought about by their mode of living, are rapidly diminishing.

A CONVENIENT CHEESE CURING ROOM.

GEORGE E. NEWELL.

A convenient curing room for cheese is necessarily on the ground floor of the factory and separated from the making apartment by a tight partition. The partition should be of matched lumber fitting closely to the floor and to the ceiling. Such a wall properly put up will exclude all steam and damp heat from the curing cheeses that fill the air of the adjoining room. As the new cheeses are taken from the hoops each morning they can be easily rolled on a truck to the shelves assigned for them. If the loft of the building is used for curing, a hoisting apparatus must be brought into requisition, as few factories employ elevators, and this is always a tedious and slow job. But it is not convenience alone that gives the ground curing room a great advantage over the elevated one. Curing cheeses demand an even temperature, and it is next to impossible to preserve one under a hot roof. The old method of opening the windows is detrimental, as the entering breezes crack the surface and retard the process of fermentation in the new stock. A model curing room, therefore, must combine convenience and adaptability. It requires something besides age to mature a cheese; it must have an even temperature of at least seventy-five degrees. A few hundred cheeses together in a room will mutually aid in curing each other, hence the advantage of massing new stock. The curing room described should be plastered on the three outside walls, and circulation admitted from the top of the windows. The most convenient counters are not stationary but simply long, stoutly constructed tables of two boards each eighteen inches in width. This will allow cheeses to be arranged in two courses, and the wide boards, which should be of hard wood planed smooth, will prevent cheeses resting over a crack and ridging the surface. The tables can all be laid back out of the way when the room is empty. When operations begin the tables in the rear are filled first; the hand truck can be run freely from the presses to the back of the room, and tables filled in front as space is needed.

TIMOTHY GRASS ON LOW LAND.

On many lands too wet in the spring to be profitably planted to corn or sown with oats, it is quite possible to grow large crops of timothy hay. But in the course of a few years red-top and blue grass choke out the timothy, and it is necessary to reseed. The usual method of reseeding old meadow or pasture land is to plow it up and cultivate it with corn or potatoes, so that the sod shall be well subdued and the weeds and blue grass roots killed. But on the kind of land we have now in mind this cannot be done. The land is dry in July, but it is too wet—at least in part—to plow for ordinary crops.

We have had excellent crops of timothy on such land by breaking it up in July and keeping the surface well worked with harrows to prevent weeds from growing, and then in August gang-plow and work the soil till it is fine and mellow. Such soil is easily worked. The real point is to kill the blue-grass roots. Work it till this is certainly accomplished. And then, any time in August or the first week in September, sow from eight to twelve quarts of timothy per acre, and cover it with a smoothing harrow or roller. If the work has been well done, and the soil is fine enough and mellow enough and moist enough to promptly start the seed, judging from actual experience, we are safe in promising a big crop of timothy hay the next summer; and now that wheat is so cheap, and hay can be shipped long distances to market, there are few crops, considering the little labor required, that pay more actual profit than a good crop of timothy hay. We have said the first crop will be a heavy one; the second is likely to be still better, and the number of years the meadow will last, before it is necessary to reseed it, will depend on the fertility of the land, and the thoroughness with which the land was worked and the old blue grass sod subdued.

LAWNS AND LAWN-MOWERS.

A large proportion of the lawns in city, village and country are deteriorating, and close examination shows the turf to be thin, the desirable grasses weak, browning quickly under drought and hot sun, while coarse, unsightly plants creep in and retain a foothold. The beauty of the lawn diminishes with age in spite of liberal fertilizing and close and regular cutting. What is the reason? Mainly, it is the excessive use of the modern lawn-mower. In nearly every locality may be found pasture lands long set with grasses fine and rich, holding color well under mid-summer sun and drought, with a thick, elastic turf, through which no color of soil can be seen—the very perfection of a lawn if it were trimmed close and even. Why does the pasture flourish through a score of years and the lawn decay? Simply because the pasture is kept nearly under natural conditions, and the lawn is subjected to an intense Chinese dwarfing system. Suppose the lawn is newly made, according to the best instructions, the soil deeply dug, enriched and made clean and fine, the seed sown and the grass plants show thick and strong. What next? The lawn-mower—twice or three times a week until growth stops in autumn. Next spring the grass makes a renewed struggle for existence, starts early and strong again. It lifts its blades to the sun and air that it may push its roots into the rich soil for moisture and sustenance. The effort is promptly met by the lawn-mower. Growth is checked above and under ground; so through an entire season and succeeding years. The law is that the root growth of the plant is in proportion to its top growth; the root growth is shallow. Of what avail is the deep, rich soil? Is it a wonder that the lawn browns early, and that coarse, hardy plants get a foothold?

Give the grass plant a chance to make adequate root growth if you would have and keep a good lawn. Read the lesson of the pasture lands. Encourage it a little, in early spring, and in the autumn lay the lawn-mower away early, and let a thick, strong growth of grass be the winter protection of the lawn.

Crops That can be Sown or Planted in July.—It is rather late to sow Swede turnips or rutabagas, but the intermediate sorts, such as yellow Aberdeen, do well sown in July, while the earlier varieties such as Golden Ball, White Flat Dutch and Purple-top Strap-leaf, can be sown the last of July or first of August. We once had a fine crop of Swede turnips sown the fourth of July, but the soil and season was unusually favorable. Of course much depends on the latitude—the farther south the later you can sow a plant. We have had good potatoes from early varieties planted the latter half of June. Early varieties of beans can be planted the last of June or the beginning of July. Also early varieties of sweet corn. Hungarian grass or millet can be sown to advantage in July, the earlier the better. Make the ground as fine and mellow as possible, and sow evenly from three pecks to a bushel of seed per acre. Cucumbers and pickles are sown the last of June to the middle of July. Cabbage and cauliflower can be set out any time in July, but toward the last of the month it will be well to plant early kinds, such as Winningstadt and Henderson's Summer among cabbage, and early Paris and early Erfurt among cauliflowers. Snowball and Erfurt Earliest Dwarf can be planted as late as the middle of August and be certain to head. Le Normand short-stem cauliflowers, one of the largest and best varieties, can be planted the middle of July. Give them plenty of room, say three feet apart each way.

The Right Time for Pruning.—The largest branch starts from a bud, which a slight movement of the fingers would have broken off. By going over young trees and rubbing off buds that appear where branches are not needed, there will be very little pruning to be done when the trees come into bearing.

PONIES FOR BUSINESS AND PLEASURE.

That there are ponies and ponies, all, even those who most admire these useful animals, are obliged to admit, but that some tribes are far more attractive than others is allowed only by those learned in pony lore. Many would-be buyers of ponies simply want a small horse and never stop to consider what are the services to be rendered and what are the characteristics best suited to fill the required need. Thus a pony is wanted for saddle work for children; or a pony is needed for light draught and short distances to be driven by adults. Again the pony has to perform both services. Sometimes the roads are hilly and the draught is heavy. At other times the work is over level roads and frequently on sandy beaches. The thoughtless owner never stops to consider how deep the wheel sinks or how severe is the strain on the collar.

The most gentle families are the Shetland and the Exmoor ponies. These animals have a wonderful instinct for obeying and taking care of children. They are docile and intelligent as any full-sized horse. Our illustration snows a pair of well-bred Exmoor ponies. The Icelandic ponies are winsome little creatures, but their shaggy coats cause them much suffering unless judiciously stabled. The Kerry pony was a veritable beast of burden. Half a century ago the greater part of the rural traffic of the western and southwestern districts of Ireland was carried on the patient backs of Kerry ponies, which were to Irish needs what donkeys were, and still are, to the mountain peasantry of Italy. When taken proper care of these Kerry ponies showed to great advantage. These were high-bred in conformation, having good shoulders, fine, well-set-on heads and sturdy legs. Where they fell short in breeding was in the hindquarters. The spine drooped towards the tail. The ponies bred in Connemara were smaller and more cobby built than those of the county Kerry. Both families were wild, and their breeding in these remote years was haphazard. In Hungary and in Italy on the Maremma of the peninsula and on the hills and plains of the Magyar land are a race of most serviceable ponies that resemble one another most strikingly, and also strongly resemble the ponies of Yorkshire, Eng. These breeds or families are strong, short backed, and when broken to harness develop, for their size, excellent trotting action and reasonable speed. But though good under the saddle, they are not truly field horses, such as are the Irish ponies. Wales also has a breed of ponies, rugged as her hills and sure footed as goats. That the breeding of ponies would be a success, there can be no doubt, as the demand in large cities is steadily on the increase. What small farmers could do with ease might be below the range of larger proprieters. A pony mare would pay her keep and nurse her foal, as for the first six to seven months she could perform all her usual duties at a moderate pace and under good stable management. The market prices of ponies vary with the attractiveness of the little animals, rather than with their actual usefulness. Thus a child's pony must be good looking, perfect in temper and an easy goer. Ponies for boys and girls should be active and even in disposition, with enough of fire in temper to arouse the watchfulness of their youthful riders and fit them in after years to control high-strung, well-bred horses.

WELL-BRED EXMOOR PONIES.

HORSE BREEDING IN MONTANA.

MIDY MORGAN.

In view of the fact that Montana has already given some valuable horses to the country, we consider it expedient to treat carefully of the advantages and the counteracting difficulties offered by the climate and soil of the inchoate State. The recognized advantages are: a most salubrious air, which insures vigorous health to those born or immigrating into the Territory; the surprising nutritiousness of the natural grasses and the widespread shelter afforded by the peculiar conformation of the land; the disadvantages are, scanty supplies of water in some localities and consequent unfitness for pasture lands; then the severity of the winters is a source of frequent loss.

A few years ago a native of Ohio settled in Montana and started a horse ranch; having ridden over a great part of several counties he decided on what appeared to him to be a favorable spot in the southern part of the Territory. The enterprise was commenced with one hundred and thirty brood mares bought in Oregon. They were a natty string, without pretentions to any particular strain of blood. Three stallions of some merit were also bought to complete the undertaking. This herd was turned loose on the range early one spring. The following summer proved a very dry one, and by the first days of autumn ten mares had famished. The winter proved exceptionally severe even for the Northwest, and at the first round-up one hundred mares and a fair contingent of foals were found to have passed safely through the hardships of their first experience. This ranch owner had cut and secured a large supply of prairie hay, which, however, was not available, as it had to be hauled a long and tedious road, and in consequence of severe weather it never reached the ranch. The stallions were wintered

at the homestead and came out safe in the spring. This statement of facts is a poor showing to induce others into a like enterprise. Still, although it establishes a loss of one-fifth of the mares, it proves that with proper foresight Montana is a safe home for a horse ranch.

Before putting mares on the range an abundant supply of water should be secured, either from a river running through the range or from living streams. The homestead should be furnished with driven wells if springs are not on the surface. Water being secured, the next care must be a liberal supply of well-cured prairie hay, not at impracticable distances, but close at hand, where the entire herd can congregate and feed in shelter at times when the weather is such as to prevent pasturing on the self-cured grasses of the range. The class of horse to be bred also requires close attention. The native mares of Montana are as yet only a mongrel class. They are part mustang and part scrub-American bred. Not long since a wild lot of these unbroken colts and fillies were offered at auction sale in New York. The youngsters were so shy and so ragged in appearance, without showing any points of superior merit, that the sale was a very poor one and no second attempt has been made. These cross-bred horses are frequently vicious and are rarely trustworthy. They are not valuable under the saddle and are almost worthless in harness.

A horse ranch in the Northwest could be made a safe investment by securing well-put-together, stout, active mares, such as can be found in New England and taking the necessary sires from the ranks of race horses of America. Annually there are scores of race horses sold out of the great racing stables of the country for prices so low that no ranchman need hesitate to buy. One stallion and from thirty to forty mares would be sufficient to commence with. The fillies born on the ranch would be acclimated from birth, and as soon as they attained proper age would be better as dams than any outside mares could be. The excellence of the strain on the range should be urged and maintained by constant infusion of fresh thoroughbred blood. We go on the basis that any but pure bred sires are a hindrance to the agricultural interests of the newer regions of the Northwest as well as to the country.

MAKING HAY.

The value of hay depends to a large extent upon the time when the grass or clover is cut, as well as upon the manner of the curing. The following table gives the feeding value of hay cut and cured at the different stages of the plants, and it is well worth the careful study of all concerned:

	Nitrogen compounds	Carbo-hydrates	Fat
Red clover before head	24.50	46.06	7.03
" " head formed	23.10	42.30	5.25
" " full bloom	17.50	47.42	4.38
" " after bloom	16.58	45.94	4.23
" " in seed	14.00	49.90	3.05
Timothy, spike unformed	11.55	50.05	4.20
" spike visible	10.85	52.22	3.10
" before bloom	9.63	50.51	3.38
" early bloom	9.63	54.01	3.63
" full bloom	9.28	55.22	3.35
" early seed	11.38	47.09	3.20

These plants bear a close relation to others of which hay is made, or which are used for feeding either by soiling or by pasturing. The figures show very clearly that upon rich soil pasturage yields the largest proportion of nutriment which the crops afford, and when the pasture is kept in good condition and is eaten closely so as to produce a continuous succession of young and tender herbage, the most nutriment is procured from the crop.

But when hay is made it is necessary to choose a time when the largest general average of value can be secured—that is, when the most actual nutriment can be obtained. As the crops progress towards maturity, the quantity increases, while the quality depreciates. But quantity increases faster than the value decreases, so that a time must be chosen when the whole crop is worth the most. This is when the clover is in full bloom; when a fertile field presents a view as of a carpet of rich purple and green over the whole surface. At this time the weight of the crop is the greatest. Last season a square rod of clover at this stage was cut and weighed immediately; the weight of the green clover was 132 pounds—equal to ten-and-one-half tons per acre, or about two-and-one-half tons of hay well cured. The same area was left uncut adjoining in two plots; one cut two weeks later when the heads were brown weighed 98½ pounds, the other, when the heads were ripe, weighed 84 pounds only. This test showed that while the quality deteriorated the quantity lessened very considerably. It needs no proof to show that the partly-grown crop would have been much less in quantity than that fully grown. So that the full bloom of the crop is the time when it should be cut, not only for clover but all the grasses and fodder crops as well. Many years' experience in soiling and pasturing cows from early spring to late summer has proved that the richest milk and the finest butter is produced from young herbage of all kinds, and that when the feeding grows late considerable help from corn meal and cottonseed meal is required to maintain the product in both quantity and quality. In soiling, a close succession of fresh crops produced by weekly plantings is therefore indispensable for the most satisfactory results.

HIGH STEPPING HORSES.

A. B. ALLEN.

I notice that the breeding of these is much oftener recommended at present in the agricultural papers than formerly. True, the action of such is more showy, and on that account is preferred by those ignorant of its injurious effects upon the horse. He has to lift his feet to an extra height, which is tiresome, and prevents his accomplishing in such action as great a distance per day on a journey as he otherwise would if not obliged to raise his feet so high, and this with considerable less fatigue at the end of the day. As the feet are replaced on the ground, the impact of high steppers is much more forcible than of others, and this is particularly injurious to the feet and legs. When traveling on a stony road or a pavement I have seen horses made so lame in a few months, or even weeks of such work, that they had to be withdrawn from use, and turned out on soft pasturage for some time to recruit. Even with this relaxation, they were unfit to go back to hard roads and had to be employed for farm work or on mellow ground ever after. Quite low stepping, on the other hand, is to be avoided, as the horse is likely to strike his foot against any little rise of ground or obstruction on the road and stumble badly, often falling down in harness, and endangering those riding in the vehicle to which he is attached, to be upset and perhaps fatally injured. A low stepper travels more easily and is less fatigued than those stepping higher. A medium between the two is best and safest.

Immediate Effect of Cross-Fertilization.—Mr. P. J. Berckmans, President of the American Pomological Society, sends us three bunches of Verbena flowers, one of which was pure white, another bright pink, and a third striped. In the accompanying note Mr. Berckmans writes: "In the discussions which followed the reading of Dr. J. C. Neal's paper on Cross-Fertilization, Mr. H. E. Van Deman stated that he did not believe in the theory of immediate effect of the pollen upon the fruit. Had never seen any evidence of such effects. I stated that my experience had given me assurance to know that immediate effect of pollen was possible, and cited instances where this had practically occurred. While fruits are thus sometimes modified in their external appearance, flowers are also apt to show such immediate effect. As an instance, I enclose herewith three bunches of Verbena flowers. The variety is one of Henderson's best white productions, and for two years has produced pure white flowers, and its name, '*Snow White*,' is, therefore, well applied. This spring a large, thrifty plant growing within two feet of a plant of '*Beauty of Oxton*,' the latter a bright pink color, produced well-defined striped flowers upon that part of the plant next to the pink variety, the flowers produced upon the other portion of the plant furthest from the latter retaining their original pure white color. Now will some expert in vegetable physiology give the explanation of this? If not caused by immediate cross-fertilization, what did cause it? It is certainly an interesting subject for investigation, and I for one would like to be enlightened."

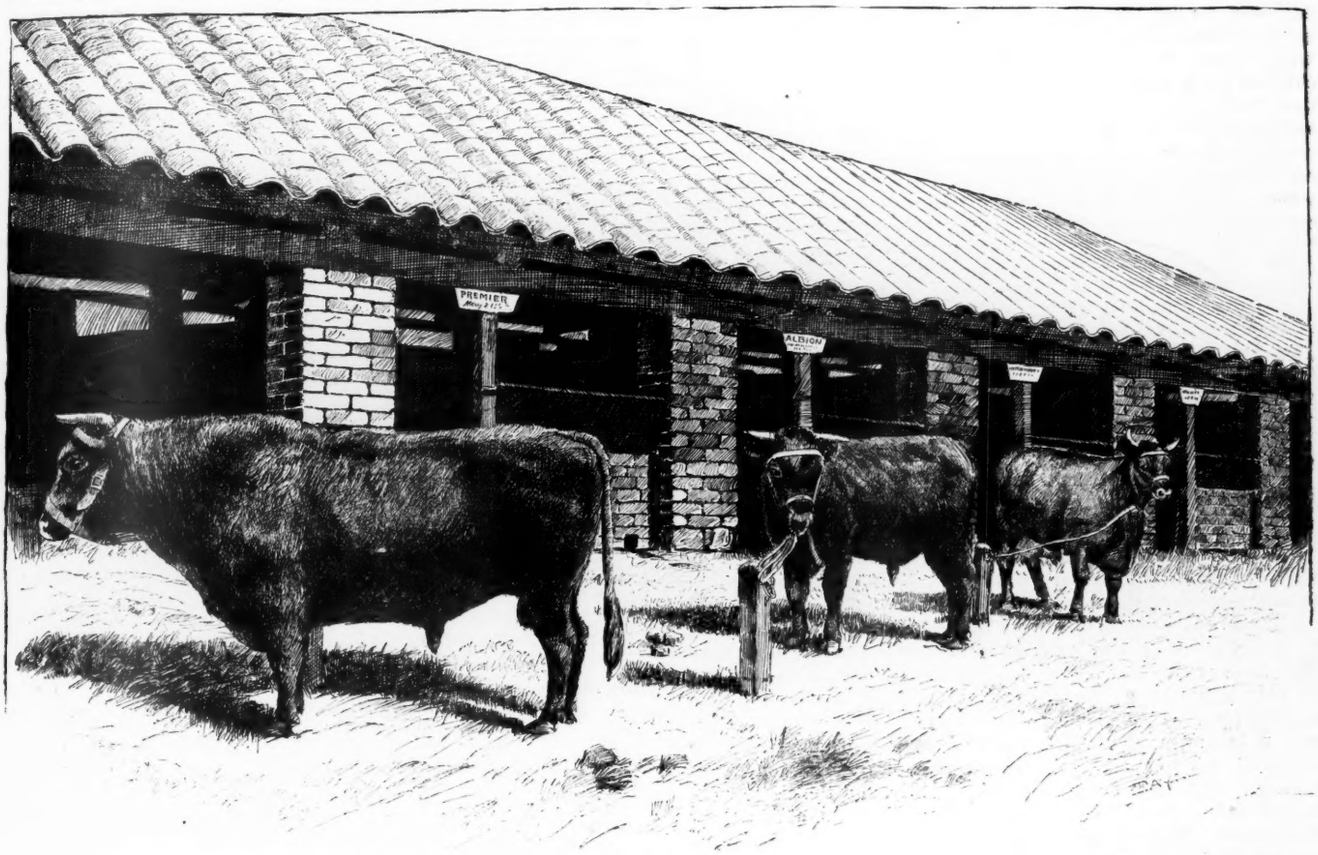
Planting Celery.—If planting celery this month, have in mind the fact that it is a plant which needs a great deal of moisture. Consequently choose a piece of low land which is naturally somewhat damp. If there are no appliances for watering, such as tanks, hose, etc., a good location may be found beside an open ditch, or small run from which water may be easily taken by means of a small pump. Very good ones, such as are sold for spraying trees, may be had for a few dollars, which, with a hundred feet of inch hose, will do duty over a considerable extent of ground.

Scrub Pedigrees.—If you want the pedigree of the scrub animal, set it down as ignorance, prejudice and parsimony inbred for generations.

A SOUTH AMERICAN SHORTHORN HERD.

Nothing marks with more emphasis the agricultural progress of the South American Republics than the introduction and rapid increase of improved live stock. Within a few recent years the Argentine Republic has become such an extensive purchaser of fine stock that a sharp competition for its trade has sprung up among the breeders of the United States and those of Great Britain and France. But it is not alone in the Atlantic States of South America that this is seen. The same activity and enterprise are notable in Chile. The government is using energetic measures to colonize its waste lands, while prominent citizens are pushing forward the development of stock-raising, dairying, wine-growing and other important branches of agriculture.

We give herewith a partial view of the cattle sheds of Don Fernandez Concha at his hacienda of Santa Rita near Santiago, Chile, together with portraits of three representatives of his pure-bred Shorthorn herd. The animal in the foreground is the Shorthorn bull Premier, at present the head of the herd. He descends in a pure unsullied line, through the Gwynne tribe from Princess, the daughter of Robert Colling's famous bull Favorite. Though of pure English blood he was imported from France to Chile, his dam Pansy Gwynne having been carried to the former country. In the background is the Duchess Shorthorn cow Coralie, of the Red Rose tribe. She represents a famous milking strain of Shorthorns, her granddam, Countess of Archdale, having won the first premium at the London dairy show of 1878. Señor Concha's large dairy herd is composed mainly of Shorthorns, as are many in England.



SHORTHORNS AT SANTA RITA, CHILE.

ORCHARD PRUNINGS.

Better one bird than a thousand larvæ.

A good mulch is a layer of fine soil, such as frequent, shallow cultivation provides.

Better feed the inferior fruits and vegetables to the hogs than to send them to market.

Many a vigorous, fruitful tree owes its existence to a mulch at this season, when it was young.

Beauty always attracts, and it is not dishonest to send clean, bright berries and fruits to market.

PIGS IN SUMMER.

F. D. CURTIS.

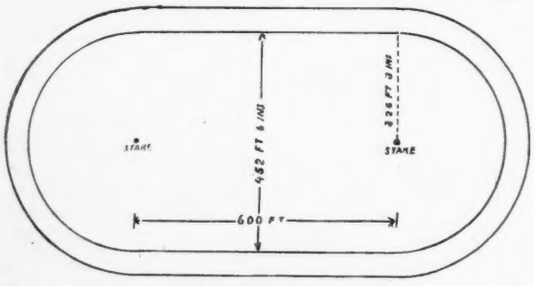
There is a way to make a profit on pigs and a way not to do it. With corn at its commercial value, in the older States, a pig confined in a pen all its life, and fed principally on corn will have cost all it will come to. There is not even a good lot of manure, as a partial offset for care and cost, as the corn will make so little manure. Many farmers will winter over a lot of corn, and feed it out during the summer for the sake of having "some fine hogs" early in autumn, not considering that this fine pork has cost all it brings. Grass should be made the basis of our pork. By grass is included, not only common pasture, but clover and green cornstalks. All of these will make pork. Perhaps not the fat stuff the corncrib can be changed into; but pork more desirable and produced much more cheaply. Hogs are fond of any kind of grass and of most weeds. They like all sorts of fruit and vegetables. When hogs have all the grain they can eat they will not take to grass or vegetables so freely. Like children fed on dainties, they do not like the coarser foods any more than pampered children will relish brown bread. Still the brown bread is the best for them and will make the strongest children. So it is with pigs—the coarser their food and the less starch and sugar they get, the better the constitution and the flesh. The common idea is to feed for the greatest gain. This is a ruinous doctrine. It is a false teaching and helps to break down the demand for pork. Consumers have, of late years, demanded leaner pork, and are gradually forcing the farmers to regard their interests.

Pig-pens in summer are an abomination. Thousands of pigs are kept in them at a loss, or with doubtful profit, when with a small outlay for suitable fencing, they could have the benefits of grass and ground, and do better and make meat far more palatable. I have found that rye bran is now the cheapest pigs' food, and it is just the thing with pasture to make lean pork. A pig will eat grass when it is three weeks old, and be all the better for it. This grass is a perfectly natural food and most healthful in its effects, for either pigs or mature hogs. They should have opportunity to go out into the fields, or to range on the ground. They will digest and assimilate their food much better. It is a fact for many farmers to know, that hogs will eat as much again corn and meal as they will digest. Putting grain into the trough and into good

wholesome meat are two different processes. The latter is the most important. Here skill comes in, and a knowledge of foods and their qualities. A hog should never be fed exclusively on corn. Because this has been done does not prove its wisdom. If there is no other food, then by all means give the pig or hog a good chance to get grass with it, and by this means it will not get so feverish, and less corn will be required. A pig running out to pasture will fatten on half the corn it will consume when shut in a pen, and the meat will be much better. There are no animals which so much require succulent food as hogs; and no one should attempt to make pork without an abundance of succulent food of some sort. The cheapest is fresh pasture. The breeding sow before she farrows requires no other food.

SHADE IN PASTURES.

In advanced agriculture pasturing is regarded as a wasteful way of feeding animals. There are pastures, but feeding is not their chief object—they are for exercise, for rest, and for comfort. How can there be any comfort in a pasture in which there is no shade. In some of the wooded portions of the country the settler or farmer appears to regard a tree as his natural enemy; created expressly for him to cut down. As to leaving groves here and there for shade, he will not listen to the suggestion. He wants his land cleared; then if he needs any trees he can plant them. He can, but rarely does. He sells out his cleared farm and moves further West, where he "clears" another farm—not to enjoy it, but to sell and repeat the operation. We have in mind one who, over seventy years old, could not give up chopping down trees. He had made himself well off and raised a large family of boys, most of whom went into the army. During the exciting times of the late civil war this old man could no longer be content to chop in the



HALF-MILE TRACK.

"back woods," but he was able to buy a piece of woodland on which he could ply his ax and still be near enough to the highway to hail the passer-by and inquire, "What's the news?"

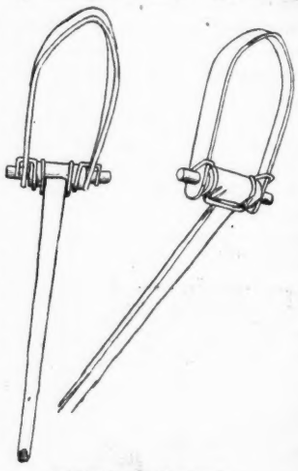
If one owns a farm upon which no shade trees have been left, he should at once put up artificial shelter, which may be done with little labor or expense. Set crotched posts at proper distances apart to hold lighter poles for "plates." Use more slender poles for rafters, upon which should be laid a roof of leafy brush. Poles may be laid upon the brush and be bound to the rafters with willow twigs, or the roofing kept from blowing off in any convenient manner. These are intended for shade only, and the sides do not need to be enclosed. The roof need be only six or eight feet above the ground. With an annual mending, the brush roof will last for several years. The comfort enjoyed by the cows under such a shelter will amply repay one who cares for the welfare of his animals for the slight trouble and cost, even if one does not take into account the greater yield of milk from cows that can "ruminate" in quiet and comfort.

LAYING OUT A HALF-MILE TRACK.

S. H. Danforth, Albany Co., Wyoming Territory, will find in the following directions and the accompanying diagram the reply to his question how to lay out a half-mile track. Measure off two straight parallel lines, each six hundred feet long and four hundred and twenty-five feet six inches apart, connected at each end with a perfect semi-circle (radius two hundred and twenty-six feet three inches). To make the curves, drive a stake midway between the ends of the parallel lines and attach to it a wire two hundred and twenty-six feet three inches in the clear, with a loop at the end to turn upon the stake. This will, from the center stake, exactly reach the ends of the parallel side lines. Describe the curve by carrying the free end around from the end of one line to the other, putting down a stake every twelve feet. Repeat this at the other end, making a continuous line. This line is the inside of the track, exactly upon which the fence may be placed. A line measured all around three feet from the fence will be exactly half a mile.

A GOOD POKE.

Where it is necessary to hamper live stock to keep them from getting out of pastures, one made on the plan illustrated is effective. The stale is attached to the head by being mortised into it. A strong shoulder must be left upon the stale where it enters the head block. This block is cylindrical, and has projections at the ends that pivot into the bow. Holes are bored in the ends of the bow, which fit over the projections on the cylinder. On the lower side of the head several spikes are firmly fixed. They point in the opposite direction from the stale on the poke, and make it uncomfortable for the animal trying to do any effective work with the poke. The bow is held in place upon the projections of the head block by a strong wire. This is first laid across the stale beside the block; then it is bent against the sides of the stale, and around the block two or three times. The ends of this wire are bent in the form of hooks, and are passed around the bow in such a way that the stale of the poke can never fall below a certain pitch. By raising the stale up till it hits the bow, these wire hooks may be detached from it, and the bow sprung open and put over the animal's neck.



SERVICEABLE POKE.

A CHEAP CORN-CRIB.

Our engraving represents the plan for a corn-house, the patent upon which has but just expired. It is intended for use where large quantities of corn are raised, and where shoveling in and getting at the grain is of importance. As will be seen at a glance, portions of one side of the roof are hinged in such a way that upon driving beside the crib the load can be shoveled in at the roof, and the roof afterward made tight again. A cross-section of the crib is shown. An inclined floor, and an inclined plate running the entire length of the crib, naturally lead it to the trough on the bottom, outside whence it is taken by means of shovels or scoops. As fast as it is removed, that remaining in the crib takes its place, the inclines causing the grain to gravitate into the trough. The narrow incline regulates the flow of the corn, and prevents it from clogging while entering the trough. Such cribs can be made of slabs or of any cheap material, and are as useful as more expensive buildings in new countries where lumber is scarce. Of course they cannot be as high as Eastern-made corn-cribs if it is expected to throw the corn in through the roof. Neither will the cheap condition of the building warrant its being erected to any great height, for it might thus catch the winds and be demolished.

CROSS SECTION OF CORN-CRIB.

HARVEST GLEANINGS.

Put the trusty team to the mower.

Forethought is one good harvest hand.

It is highly extravagant to use low-priced mower oil.

Twelve hours with system harvests more than sixteen hours without.

Harvest dinners are not prepared by a machine that needs only a driver.

There is no luck in leisure in harvesting; procrastination is the thief of grain and grass.

One hour of the physician in the sick room costs as much as a week's wages of a girl in the kitchen.

PRICKLY PEAR AS A WEED.

The name "prickly pear" is given to various species of *Opuntia*, on account of their pear-shaped, edible fruit. For the same reason they are also termed "Indian fig." The few species in the Eastern States have a range from Nantucket, R. I., to the Gulf States, and others still are found from Wisconsin southward. But it is western Texas, northern Mexico, Arizona and the country adjoining that is the home of the *Cactaceæ* generally, and the *Opuntia* especially. Some species are natives of South America, and it is estimated that there are in all over 100 species. They nearly all have stems made up of feathered joints, with a green rind that answers the purpose of leaves; they are all furnished with spines, which in some species are truly formidable. They all have yellow flowers, followed by a mostly edible and often spicy fruit. Those who only know the fruit of the common species, *Opuntia vulgaris*, can have no idea of the great excellence of the fruit of some of the far-Western species. The Mexicans, by the dextrous use of a handful of grass, remove the spines while the fruit is still upon the plant, and it may then be eaten without inconvenience. The writer has eaten some of these fruits which at the time seemed more delicious than any other fruit, suggesting the flavors of peaches, strawberries, pineapples, etc., all in one. Though not rare in the older States, and very abundant in the far West, we never heard of their becoming aggressive in cultivated ground. All the *Cactaceæ* are natives of the American continent and the West India islands. They were long ago cultivated in Europe, some as food for the cochineal insect, others as hedge plants, and others still for their fruit, and they are naturalized on both shores of the Mediterranean. Prickly pears have also been introduced into India, in some parts of which, finding favorable conditions, they have established themselves and become most formidable weeds, to the extent of driving the people from their villages, and even ancient cities have been depopulated. The dense growth of prickly pear attracts all kinds of rubbish, and greatly interferes with the sanitary condition of the towns. It is a matter of so much importance as to call forth a report from the sanitary authorities of the government of Bombay. The only successful means for destroying this pest—burning having been tried in vain—is to cover the plant with three feet of earth, or enough to exclude light and air. The government is asked to enact a law requiring all prickly pears growing near inhabited places to be covered with three feet of earth. This is a good deal of soil to move, and we fear that the inhabitants will be in the condition of some of our Western farmers in early times, who found it cheaper to build a new barn than to remove the manure pile that had accumulated by the side of the old one. The reports fail to inform us what species of *Opuntia* it is that proves such a serious trouble as a weed.

Misnomers.—When a man doesn't know how to run an engine, he is not called an engineer; when he can't repeat the multiplication table, he is not called a mathematician; but any man who tries to farm, though he doesn't know how it should be done, doesn't know even the multiplication table of it, is called a farmer. He is misnamed, and that's why so many called farmers are also called failures.

THORNS—NATIVE AND FOREIGN.

The accompanying illustration represents a variety of the "Mexican Thorn" (*Cratægus Mexicana var Carrieri*), which was claimed by the French botanist and horticulturist to have been raised by him from a seed of the typical *C. Mexicana*. In what particulars it differs from the type or why it should be named after Carrière, are points upon which French botanists are not agreed. The engraving in the "Gardeners' Chronicle," England, which is here reproduced, was from a specimen that flowered at Queenstown, in the south of Ireland, and it appears to be a species that will flourish near the sea. The leaves are said to turn to a rich bronzy-red in autumn, and to remain on the tree for a long time. The fruit is described as three-quarters of an inch in diameter, and of a bright scarlet color. To one who is familiar with the Mexican vegetation, at least in the Northern States, the name "Mexican Thorn" will hardly be a distinct one, as in that country every bush or small tree, if not botanically a "Thorn," is emphatically *thorny*. Every bush is armed with spines, and there are several which are made up entirely of spines. These make up the *chapparel*, that one reads of in accounts of that country; the name is then applied to a thicket of bushes, a name which in the true Castilian is applied to a plantation of "Live Oaks." There is one genus named by Gray, *Holacantha*, a name made up from the Greek words *wholly* and *thorn*, and it is certainly descriptive. The shrub, six or eight feet high, is without leaves, but its green bark answers their purpose. It is much branched, with every branch and twig ending in a very sharp and smooth spine. There are in the region referred to several other shrubs, of a similar character, mostly leafless and mere masses of spines. Aside from these shrubs, which are all spines, almost every other, though furnished with leaves, has its branches and twigs sharpened to a point, besides bearing distinct prickers. This tendency to be prickly sometimes manifests itself in an unpleasant manner. A United States army surgeon stationed opposite the Mexican town of El Paso informed the writer that in the peach season the whole population were affected with sore eyes. The down upon the peaches was developed as minute spines or *spiculæ*, which rendered the eating of peaches, which grow abundantly there, a not unalloyed pleasure. This surgeon was of the opinion that this far from "velvety down" floated in the air and affected the eyes of the people.

CARRIERE'S MEXICAN THORN.

This "Mexican Thorn" reminds us to say a word of our native thorns, of which we have in all North America, according to Prof. Sargent's admirable Census Report on Forestry (1880), fourteen

species, some of which have several well-marked varieties. Some of these are peculiar to the Pacific Coast, others to the Southern States, while several grow in our northernmost localities, a few having a remarkably wide range, from Canada to the Gulf States. According to Emerson, our native thorns have been carried to Europe and have there received great attention. It is found that a greater variety of beautiful small trees and ornamental shrubs can be formed of the several species of thorns than of any other kind of tree whatever. They thus give persons whose grounds are not extensive the means of ornamenting them with great facility. If trained as trees, they have an appearance of singular neatness united with a good degree of vigor, and the readiness with which they are pruned or grafted renders them susceptible of almost any shape which the fancy of the owner would have them assume. Some of the species native to Massachusetts often take, even in a state of nature, the shape of handsome low trees. Of these, the flowers and foliage have great beauty, and the scarlet hues, which remain on into the winter until, ripened by the frosts, they are gathered by the birds, give them an additional charm. Upon these tall species all the others, very various, and many of them very beautiful, may be grafted.

The name of the genus, *Cratægus*, is derived from the Greek for "strength." The wood, though very heavy and hard, is not, as a general thing, strong. It varies in color from yellowish white to various shades of red and brownish crimson. It takes a beautiful polish, but as the trunks of the trees are rarely a foot in diameter, its use is limited to the making of small articles, such as canes, etc. As ornamental trees or shrubs, we would direct the attention of those interested in ornamental planting to the much-neglected native thorns. In their flowers our native species do not present great varieties, their distinguishing characters being found in the leaves and fruit. The fruit varies greatly in size and flavor. The fruit of several Southern species under the names of "Summer Haw," "Apple Haw," etc., are much used in preserves, jellies, etc. The excellence of some of these wild fruits suggests that they may be improved by selection and cultivation.

THE MANURE QUESTION IN THE SOUTH.

HENRY STEWART, NORTH CAROLINA.

Southern farmers find it difficult to procure the manure required by their crops, and are thus forced to buy fertilizers at a large cost. If a way can be found to procure manure and yet to use the purchased fertilizers, with a corresponding advantage in an increased yield, there can be no objection to any farmer buying all the fertilizers he can pay for; for it is not my intention in any way to deprecate the use of all the purchased fertilizers that can be procured and used with profit, although I do emphatically object to the very common practice of Southern farmers buying fertilizers at a high price on a year's credit and neglecting to avail themselves of the natural stores of fertility which lie useless around them, or which they waste by the grossest neglect.

Mr. Fordman is a well-known farmer in a Southern State, and he has made his name a "household word" by his example in the way of utilizing every source of manure for the purpose of adding it to a liberal supply of purchased fertilizers for the growth of crops which he has increased four-fold by this system. His plan is by no means new or difficult. He feeds as many cattle as he can, keeping them penned at night, and well littered with every waste material he can gather. Thus he makes a large quantity of coarse manure. To this is added the cleanings of the ditches, leaves which are piled by the winds in fence corners, ashes and cotton seed. Thirty bushels, or an ordinary wagon load of manure are spread as a foundation; on this is spread 1,000 pounds of acid phosphate; over this he puts the coarse stuff, and so repeats until he has a pile five feet high, broad and squarely built up, and this he covers with a foot of good soil. After lying two months the heap is spaded down and again put into heaps and left to still further decompose and mix. In the end he has a rich fertilizer which he puts in the rows of the cotton and corn, at the rate of 1,000 to 2,000 pounds per acre, with the result that the yield of cotton is from 1,000 to 1,500 pounds of lint per acre and of the corn from thirty to fifty bushels. He is thus able to make all the pork he requires; to feed some cattle for beeves; to have all the corn needed for his stock and his laborers; to grow all his fodder and hay and peas, potatoes and millet; and at the same time to keep the land improving all the time. If Southern farmers would only follow this example for two or three years, the South would roll in wealth instead of lying plunged in debt; there would be food and fodder, horses, mules, cattle, sheep and wool to sell, and the genial climate and rich soil of the South would be turned to the profitable uses which Nature intended for them.

THICK OR THIN SEEDING.

Mr. Dudley W. Adams, Orange Co., Florida, writes us as follows concerning a recent article in the AMERICAN AGRICULTURIST: "Professor Blount says rich land requires less seed than poor. Why, Professor? In Florida we have some very poor, as well as some very rich land. On poor land three pecks of oats sown per acre will produce a fair crop. If three bushels per acre are sown the crop will never head out. The largest crop of wheat I ever grew while living in Iowa was produced from less than two pecks of seed per acre. That was on rich land. The Professor is quite correct when he says: 'The greatest enemy to the successful germination and healthy growth of the wheat plant is wheat;' and in a long experience I have invariably found that the poorer the soil the greater the damage from crowding. On a rich soil a thin seeding will tiller and make the plants thick enough for a maximum crop. On poor land thin seeding will not tiller, so there will be fair heads on the few stalks, but if by thick seeding the number of stalks is increased, the size of heads will diminish more than the number will increase."

The question and remarks having been submitted by us to Prof. A. E. Blount, he replies as follows:

"Rich land requires less seed than poor. 'Why?' asks your Florida correspondent. Because wheat, oats, etc., have characteristics peculiar to themselves, which, if not favored, prevent the plant from making a successful growth and yield. Tillering is one characteristic—and a very important one, too. A single wheat plant requires space and sunlight to carry out this habit, or it will, like poor, crowded people, become weak, impotent, and unproductive of good results.

"Good wheat land—not alluvial soils, or soils heavily manured—stimulates germination and an early growth, inasmuch that the plant's power is shown in the stooling or multiplication of many stalks from one grain. Poor land fails very manifestly in these two most important and mechanical operations. It neither stimulates germination nor early growth, but merely acts as a reservoir to hold and supply the grain with moisture, while the atmosphere imperfectly does its share towards the development. The 'happy medium' in both richness of soil and amount of seed necessary to produce a crop of good quality and quantity, must be carefully considered by the farmer. Too rich soil produces too many tillers, too much stalk and too rank a growth, all to the great detriment of sound, plump grain."

FEEDING CALVES.

GEORGE E. NEWELL, NEW YORK.

Farmers have various contrivances for feeding young calves waste milk and whey, but out of the many very few are convenient or desirable. As soon as grass has a good start calves designed to be raised for the dairy are generally put into a small enclosure, sometimes a young orchard, near the farm house, there to graze or nibble at the bark of trees. Twice or three times a day the hired boy will carry them their ration of drink, thickened with a few handfuls of middlings or oil meal. Sometimes the liquid is portioned out in a row of buckets standing on the ground, which the calves alternately butt over, and crowd two heads into one in their greed and haste. Often such an arrangement is supplemented by a long trough standing on raised legs, which is twice a day filled to the brim with calf swill, and the young bovines are left to wrangle over it. The sequel of such methods of feeding is that the strongest and greediest animals will pod out with the bulk of the rations designed for all, and the weakly ones will grow still thinner and more weakly as their scanty feed tells upon their growth. If calves are set apart to raise, their wants must be bountifully supplied, as they are to form the future dairy herd. In feeding calves it is the height of folly to give their food in bulk and let them squabble over the division. They need a certain amount of food at regular intervals, and must take it at leisure and in peace. The following-described device is both efficacious and practicable. At a convenient corner of the calf pasture put up some light stanchions similar to those in the cow stable, only dwarfed in size. Have them take the place of the fence as far as they go. Take one broad board or two

narrow ones cleated together, and through the center of the strip saw circular holes at distances apart corresponding with the width between stanchions. The holes should be of diameter sufficient to take in a pail or bucket two-thirds of its depth. Fasten this level in front of the stanchions by nailing it to supports at each end and in the middle. At feeding time set a bucket of whey or milk into each hole and the calves will come gamboling up and thrust their heads through the apertures of the stanchions, where they can be quickly fastened in and remain separated while eating. By this system it is impossible for one greedy creature, after it has devoured its own portion to get away and rob a slower-eating companion. The rack holds the buckets so firmly in place that the calves can butt them to their hearts' content without upsetting. The stanchion frame and the rack, being portable, can be stored when not in use.

THE TROPICAL PAPAW.

It is unfortunate that Papaw is applied as a common name to two very different vegetable productions. All through the Southern and Western States is found, especially along the rivers, a small tree sometimes twenty or more feet high. This bears peculiar lurid flowers and a fruit six inches or more long and half as thick, containing two rows of flattened seeds in a pulp which, when ripe, is semi-solid and very sweet, of which many persons are fond. This fruit and tree are universally called Papaw, though its proper name is Custard apple, a name by which a related fruit in the West Indies is known. Its botanical name is *Asimina*, from Asiminier, the name the early French colonists gave the fruit. It belongs to the *Anonaceæ* Family, which includes the Sour-Sop and other tropical fruits. The true Papaw is a native of tropical South America and is cultivated to some extent in most warm countries. Papaw, which sounds like an aboriginal name, is said to be from the French. The species especially known by this name is the *Carica Papaya*. This is a low tree rarely exceeding twenty feet, with a soft, woody trunk, a foot in diameter at the base. The large and often much-divided leaves are clustered over the summit, and give the tree some resemblance to a palm. The staminate and pistillate flowers, mostly on separate trees, are in long clusters, borne in the axils of the old leaves. The oblong fruit has much the appearance of a small melon. Some of the species have a very acrid juice, a drop of which will blister the skin, and remarkable stories are told about the efficacy of the Papaw in rendering tough meat tender. Merely suspending newly-killed meat or old poultry in the tree is said to separate the fibers of the meat and make even a steak of the variety known as "boarding house" delightfully tender and eatable. Old swine and old poultry are fed upon the fruit and leaves for a few hours before killing, with a similar effect upon the flesh. Our illustration represents trees growing in Lee county, Florida, and is engraved from a photograph sent us by Dr. L. C. Washburn, superintendent of the tropical experiment station of Florida, who writes us: "The Papaw is only grown in South Florida, out of the way of frosts. So far it is only cultivated for home use, as it will not bear transportation very well, unless picked green. There are several varieties, all of them prodigious bearers. The Bird Papaw is only as large as a good-sized apple, while other varieties are as large as big cantelopes. They are usually eaten raw with salt and pepper, like musk melons. They are also stewed and eaten with the addition of a little lemon juice, and may be used for sauces and pies. The tree is a perpetual bearer."

THE TROPICAL PAPAW IN FLORIDA.

FEEDING OATS UNTHRESHED.

If the high price of binder twine impresses upon farmers the advantages of feeding unthreshed oats, it will not be an unmixed evil. By feeding the oats unthreshed we may save both binding and threshing—equivalent to five cents per bushel; with actual gain in feeding value. The nutritive ratio of oat straw is about 1:30, while the nutritive ratio of a proper food for fattening cattle should be 1:10, for fattening sheep 1:9, and for ork animals at labor or rest about 1:6. It is apparent that oat straw is deficient in the albuminoids, either for work or fattening animals. Two-thirds of the protein free compounds must be wasted when the straw is fed alone. The starvation of an animal fed straw alone is only a question of time. The grain of oats has a higher albuminoid ratio than is required for fattening or work animals. Hence, by feeding the grain and straw together, we have a better ration than if fed separate. If we run the unthreshed oats through a cutter, and moisten the cut stuff, the grain, chaff and straw will be masticated and digested together, we have a better balanced ration, and one more easily digested. The quality of the feed is improved by cutting the crop while the straw has yet a slight green tinge, and before the grain has quite hardened. It is not difficult to cure and keep it when cut at this stage, especially when it is not bound. Whether the oats are bound or not, in a majority of cases they are not cut early enough; and delaying cutting also increases the chances of their being lodged. Oats to be fed unthreshed may be mown and raked into windrows. But those having reapers will find it better to use them, leaving the oats in bunches, which may be thrown on the wagon. Self-binders can be used, leaving off the twine or wire. As soon as the oats are cured they are mowed away or put in barracks. It is difficult to stack them so they will keep well. Those lacking mows and possessed of a hay and straw press or able to hire one at a reasonable figure, will find the best plan to be to allow the oats to cure well in the field and then bale them at once. They will then require comparatively little space; the bales may be built up, and with a good roof of boards over them, the damage will be practically nothing.

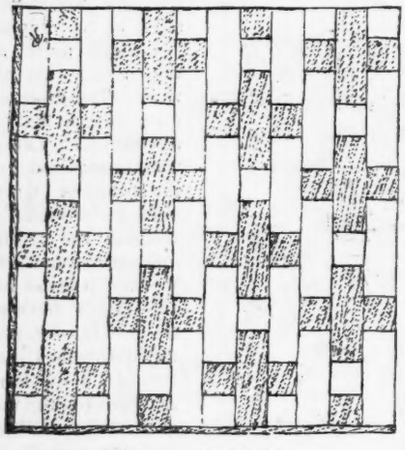
THE HOUSEHOLD

Brooms—How to Buy and Use Them.

MRS. J. M. MILLIGAN, TEXAS.

It is doubtful if there is any surer index to the qualifications of a housekeeper than the condition of her brooms. In buying brooms those with varnished handles are to be avoided, the natural moisture of the hand being sufficient to make them sticky. It is usually cheaper, and will be found a convenience to buy brooms by the half dozen or more. If kept in a dry place they are not injured by keeping except in the elasticity and toughness of the brush, and this is easily restored by dipping in hot water. Brooms of medium weight and size are preferable to the very heavy or very light ones. Those made of fine greenish straw are of better quality than those made of coarse red straw.

There should be in every house one or more *fixed* places for brooms on each floor, three at least for the first floor, so that carpet, kitchen and scrubbing brooms may be kept distinct. A broom that has not a fixed place is a time waster and a worry. A good simple way of suspending brooms is by a stout cord run through holes bored in the upper ends of the handles. It is well to select brooms with the holes already made, as the wood of some handles is so hard that it is almost impossible to pierce them without the proper tools. There are several reasons why it is better that brooms should be hung up. If a broom is stood on its brush it



GREEK CROSS QUILT.

becomes an angular, forlorn object, with which it is impossible to sweep easily or well. Walls are marred by handles or brush being dropped against them many times a day. An inverted broom suggests a laborious worker; two unnecessary turns of this implement every time it is used might, in time, prove "the straw too much." Finally, if a wet broom is inverted, the moisture has free way to the closely-laid parts of the brush and soon causes mustiness and decay.

Dr. Franklin is credited with introducing broom corn into the United States, he finding a single seed in a ladies' brush—said to have been imported from India—which he planted. There are now 30,000 acres of this plant cultivated here, with an annual crop valued at $1,590,000.

Quilt—Greek Cross.

Our engraving shows a nice way to make a quilt for one who desires a handsome one, but cannot spend much time making it, as it can be pieced wholly by machine if necessary. The quilt is pink and plain white. A part of each kind is cut into small squares, and the rest into pieces of the same width as the squares and three times as long. They are pieced together in long strips—being first arranged, as shown, so that the pink forms Greek Crosses on the plain white ground—and the strips are then united by long, straight seams. Handsome summer dresses—satines, chambreys, etc.—that have lost their freshness, but are too delicate for everyday wear, might be rapidly converted into pretty quilts by using this design, mingling the figured goods with white or with plain material of any pretty contrasting color.

Door and Window Screens.

WEBB DONNELL, MAINE.

Screen doors and windows made by regular mechanics are usually fitted at the joints by a mortise and tenon, which presents a great difficulty to an inexperienced worker. The accompanying illustrations show a very simple, yet excellent, way to frame these joints. For doors seven-eighths inch pine boards should be used, making the side-pieces and the top three-and-a-half inches or four inches wide. The cross-pieces in the middle and at the bottom should be wider, to give firmness to the frame. The ends of the cross-pieces and the edges of the sides should be squared as evenly as possible, to insure a good joint; then let holes be bored with a half-inch bit through the sides and several inches into the ends of the cross-pieces. In boring through the side-pieces, having marked the direction which the opening is to take, bore half way in from one side; then turn the piece over and bore in from the other side, and finish the work. Make pins of hard wood, half an inch in size, and, having driven them in as shown in Fig. 2, pin them firmly with brads in the cross-pieces, and wedge them at the end in the side-pieces. Two pins should be placed at every joint. Small braces, such as are shown in Fig. 1, can be procured at a cabinet-maker's for a few cents per door, and add much to the attractiveness and strength of the frame. Before putting on the netting, the frame should be oiled or stained. The hinges should be of a kind that have a spring in themselves, as a screen door which will not close of itself is likely to prove a snare and a delusion. The netting should be stretched on tightly and nailed with tacks. Either cotton netting or wire may be used; preferably the latter, as it looks better and lasts almost indefinitely if proper care is taken. Window screens, shown in Fig. 3, can be made much more easily. Using strips of wood about one-and-three-quarter inches wide, the corners can be put together by the use of the long wire nails that are now obtainable. These, if carefully driven, will not split the wood. When the braces are put in

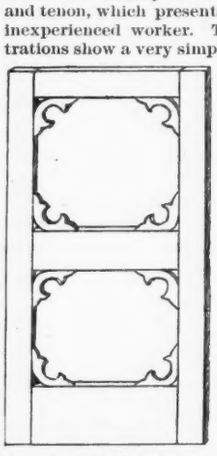


FIG. 1. DOOR SCREEN.

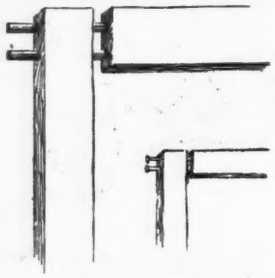


FIG. 2. JOINTS.

with small wire nails, and the netting stretched tightly from all sides, a very firm screen will be the result. These should be made to fit the window frame and lap an inch or so over the upper and outer sash, on the outside. There will then be no difficulty in raising the inner and lower sash at any time. If once the luxury of screens in every open door and window were experienced by the thousands who now wage a losing battle every summer with flies and mosquitoes, they would wonder how they ever existed without them.

"Multum in Parvo."

A very pretty gift is the *Multum in Parvo*, so-called because on a single ribbon one finds everything necessary for an afternoon's sewing. To make it, select a strong gros grain ribbon, of any pretty shade, two-and-a-half inches wide and a yard long. Finish one end as a needle-book, having three inches of the ribbon for the outside of each cover, the lining being of a prettily contrasting shade, and the leaves of three dainty shades of flannel, button-holed at the edges. There should also be a row of feather stitching across the top, done in embroidery silk of a shade that blends or contrasts with that of the ribbon. Leave a space of ten inches, then make a pocket two-and-a-half inches deep, the color of the ribbon or embroidery silk as preferred. Gather prettily, sewing the bottom and sides fast to the ribbon.

The top of the pocket should be gathered on elastic, as the spools of cotton or silk for which the pocket is intended are then less likely to drop out. Leave two inches again, and make another similar

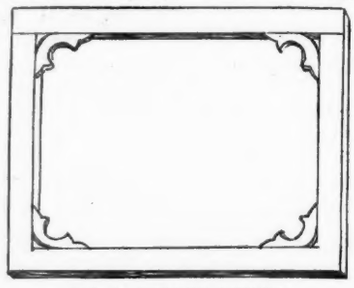


FIG. 3. WINDOW SCREEN.

pocket, this one being designed for thimble, wax, emery, etc. Just above and below each pocket, embroider some pretty pattern or make simply a row of feather stitching. Now take the other end of the ribbon and cut out a long V; gather both points and fasten to the handle of a pretty pair of scissors having rounded ends.

The ribbon should be folded in the middle, making each end nearly half a yard long. Then it may be fastened at the side of the dress or on a belt by means of a fancy pin, so that the scissors will hang underneath, the needle-book and pockets being on the outside.

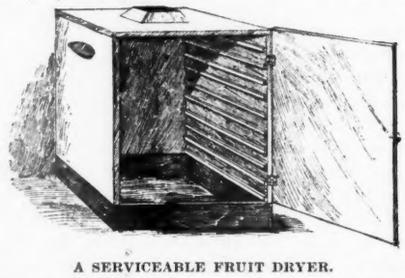
Of course there is great opportunity for the display of individual taste in the decoration, which may be simple or elaborate, as one pleases.

Housekeepers and people who sew a great deal will usually prefer their generous sewing-baskets or work-bags to any arrangement of this kind, however complete. Yet it will be found very convenient when visiting, or when one takes her sewing and spends the afternoon with a neighbor. It is especially appropriate, however, for young ladies who have a fondness for pretty things and perhaps need some charming contrivance, of this kind to make them think of sewing.

For a birthday or Christmas present from one girl friend to another, nothing prettier nor more appropriate could be desired.

A Home-Made Fruit-Dryer.

Our illustration represents a cheap and effective fruit-dryer, which may be set upon the kitchen stove. It is made of inch lumber, with a base of



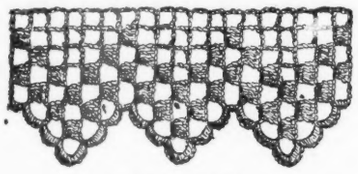
A SERVICEABLE FRUIT DRYER.

sheet iron four inches wide to protect it from burning. The slats, which are nailed inside to support the trays, are two inches apart. The dryer may be made of any desired height, from two to four feet, the capacity increasing with the height. The trays upon which the fruit is spread are mere frames of wood, of a size to slide easily upon the slats of the dryer. Each tray is bottomed with narrow strips of wood, far enough apart to admit hot air and hold the fruit from falling through. Galvanized wire netting would be better but more costly. The dryer has an opening in the

top for the escape of the vapor-laden hot air, and a handle on each side for lifting it. The door has two transverse cleats firmly screwed on the outside, to prevent warping. Such a dryer may be made by anyone who can use tools with a very small outlay for materials.

Railroad Lace.

In simplicity of design and rapidity of manufacture this lace has few rivals. It is a nice pattern



RAILROAD LACE.

for beginners, or for anyone not accustomed to crocheting laces; it can be made so swiftly by adepts at the work that none who try will wonder at its name. It makes a very pretty edge for undergarments or for children's wear.

Begin with a chain of nineteen stitches.

First row—One double crochet each in the seventh, eighth, ninth and tenth stitches of the chain, chain two, pass over two stitches, one double crochet in each of the next four stitches, two chain, one double crochet in the last stitch, turn.

Second row—Chain seven, one double crochet in the last double crochet of the first row, two double crochet in the next space, one double crochet in the next double crochet, chain two, pass two double crochet, one double crochet in the next double crochet, two double crochet in the next space, one double crochet in the next double crochet, chain two, pass two double crochet, one double crochet in the next double crochet, chain two, one double crochet in the third stitch of the last loop, turn.

Third row—Chain five, one double crochet in the first double crochet of the last row, chain two, one double crochet in the next double crochet, chain two, pass two double crochet, one double crochet in the next double crochet two double crochet in the space, one double crochet in the next double crochet, chain two, pass two double crochet, one double crochet in the next double crochet, three double crochet in the last loop, chain two, push the last three double crochet back closely on the chain and work one long treble (over three times) into the stitch of the chain close to the base of the last double crochet (working off only two stitches at a time, of course,—this makes the loop for the edge-scallop), turn.

Fourth row—Chain five, one double crochet inthe last stitch of the preceding row, two double crochet in the space, one double crochet in the first double crochet, chain two, pass two double crochet, one double crochet in the next double crochet, two double crochet in the space, one double crochet in the next double crochet, two chain, pass two double crochet, one double crochet in the next double crochet, chain two, one double crochet in the next double crochet, chain two, one double crochet in the next double crochet, chain two, one double crochet in the third stitch of the last loop, turn.

Fifth row—Chain five, one double crochet in the first double crochet, chain two, one double crochet in the next double crochet, chain two, one double crochet in the next double crochet, two double crochet in the space, one double crochet in the next double crochet, chain two, pass two double crochet, one double crochet in the next double crochet, two double crochet in the space, one double crochet in the next double crochet, pass two double crochet, one long treble, (over three times) in the last double crochet, turn.

Sixth row—Chain four, one double crochet in the fourth double crochet, two double crochet in the space, one double crochet in the next double crochet, chain two, pass two double crochet, one double crochet in the next double crochet, two double crochet in the space, one double crochet in the next double crochet, chain two, one double crochet in the next double crochet, chain two, one double crochet in the third stitch of the last loop, turn.

Begin again at the first row by making five chain, one double crochet in the first double crochet, two double crochet in the space, and so on, putting the last double crochet in the row into the last double crochet of the preceding row, then turn.

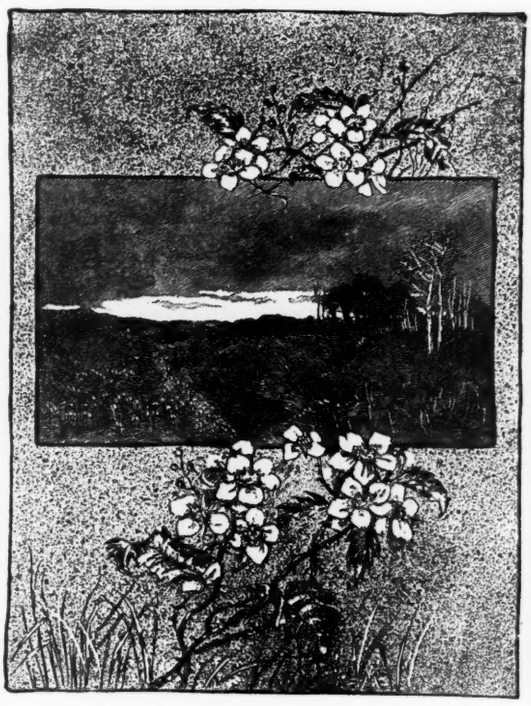
When the required length of lace is completed turn and work back, making a border in the loops along the scalloped edge thus:

Border—Work two single crochet in the space between the scallops, *then insert the hook in the top of the double crochet that is just below the loose stitch that comes between this space and the first loop, thread over, draw back through the stitch on the hook and draw up very closely, thus making a close slip-stitch* (which between stars will be called a slip-stitch; it comes between every loop in the scallop), work five single crochet in the first loop, one slip-stitch, five single crochet in the next, one slip-stitch, seven single crochet in the next, one slip-stitch, five in the next, one slip-stitch, five in the next, one slip-stitch, repeat.

("Double crochet"—thread over twice.)

Strainer for Cream and Buttermilk.

We illustrate herewith a cheap home-made device, which is quite as effective as the more costly implements for straining cream into the churn, and buttermilk as it is drawn out. Two frames,



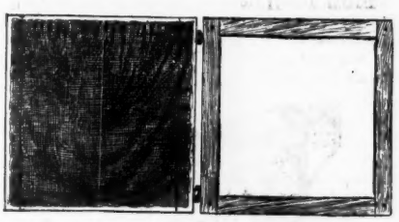
SUBJECT FOR WATER COLOR PAINTING.

each twelve inches square, are made of pine three-quarters of an inch thick and one inch wide, and hinged together at one edge. Small brads are driven into the inner side of one frame, leaving the heads projecting about one-fourth of an inch. When it is to be used, a piece of cheese-cloth, large enough to loosely cover the frame, is pressed down upon the rows of brads and the open frame shut down upon it so firmly as to press the projecting tops of the brads into the soft wood. This holds the cheese-cloth strainer in position. It is then used in the same manner as the tin and wire gauze strainers, to catch any lumps in the cream before churning, and to separate all particles of butter from the buttermilk as it is drawn from the churn.

Painting in Water Colors.

PAUL O. MUELLER.

The accompanying illustration is a design for a picture to be used for either a folding screen, fire screen, plaque or panel. The landscape in the center is a quiet spring twilight—purple gray sky, with a few gold green and gold red lines at the horizon, the landscape being somber brown, green and red—purple and bluish toward the horizon. To use the design for a screen of quite large size, take bluish gray, brownish gray, or slate gray paper suitable to the scale of colors to be chosen in executing the picture; cartridge paper is the best. The frame being stretched with wet muslin, mount the paper by first covering the back of the same with starchy paste; put it on carefully in proper place and rub down gently with brush and towel. The beginner should use water colors. Tube colors are best for those working quite regularly; others take pan or cake colors. If large quantities are required (for large three-fold screens it is well to get decorative painters' colors, powdered) grind



HOME-MADE STRAINER.

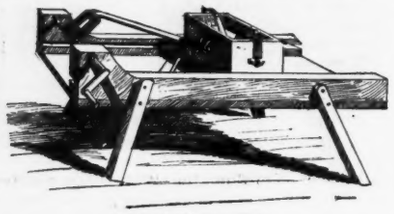
them well with a mortar or brayer on a glass or marble slab, first adding a little water. After the colors are ground quite fine add a little solution of pure gum arabic, and a little honey to insure the colors being flexible so that they will not crack easily if put on thick, as may often be necessary in order to obtain the desired effect. Sketch the different parts of the design roughly with charcoal, using great care to get each part in its proper place. Do not at first devote much time to detail. In making blossoms, for example, draw a circle at first for each flower, and plain lines for the twigs, so as to get everything in its place. Then attend to the detail.

The colors for this design may be: Chinese white, Cadmium light, dark or medium, Indian red, burnt Sienna, raw Sienna, Cobalt blue or Ultramarine, and Ivory black. Or substitute one for the other of similar value. Treat the landscape simply, painting everything in broad strokes with a good sized brush. In fact, leave the small brush to the more experienced worker. Mix the two Cadmiums each with a little white. Paint the glow of twilight on the horizon first in moderate strength, the more brilliant touches to be added when the picture is nearly complete. The cloudy part of the sky may be painted with a mixture of Cobalt, Indian red and Ivory black, so as to appear in purple gray tones of more or less warmth, according to the amount of red used. The landscape itself, simple as it may look, has to be painted with due consideration so as to get as near as possible to the feeling. Commence at the distance with the colors of the sky, only in stronger tints; when dry, glaze in different places with Indian red, burnt or raw Sienna, and a mixture of either of these colors so as to produce dull and warm brown greens. Continue with these tints into the foreground, which in this sketch has to have the paler tints; if in any place or places the color is thinly laid, showing some of the paper tint, it is well to consider whether to retouch the part or rather let it stand for the suggestion of a rock, stone, etc., such objects showing but dimly at this time of day. The birches to the right are to appear in subdued purplish gray, not white, the foliage being added with a somewhat spread brush. The blackberry blossoms require very little more than correct outlines, and broad, plain touches of color. Paint the blossoms first with a thin layer of white, so that they will appear quite bluish. When they are dry add broad touches of white with a little red, leaving sufficient parts bluish to answer for shadows. The center is to be greenish yellow, with dots and lines of burnt Sienna and black. Give the leaves a tint of either burnt or raw Sienna, treating each one differently, some even pale green with touches of black. Add to the brown leaves touches of different greens, letting part of the brown stand, lay in the veins and stronger shadow, with red and black or pure red, burnt Sienna and similar tints. Avoid in this design, as regards foliage and grasses, all crude greens.

Home-Made Cabbage Cutter.

We depict herewith a very useful cabbage-cutter from a sketch by Charles Sederer, Illinois. It has a frame made of maple or other fine-grained wood, an inch and a quarter thick. The bottom is four feet long and one foot wide. The sides are the

same in length and four inches wide. At one end pieces shaped as shown in the engraving, four inches wide and six inches long on top, sloping to twelve inches, are firmly attached. One inch above the bottom are grooves half an inch deep and the same in width, extending the entire length of each. About the center of the bottom a hole is cut, ten inches square, in which three knives are set diagonally and nearly flatwise, the edge being slightly higher than the backs. The cutting-box is twelve inches square and ten inches deep, made of inch boards. A half-inch cleat of fine, hard wood is screwed to each side, a little less than an inch from the bottom. These cleats run freely in the



CABBAGE CUTTER.

grooves at the sides. A round hole ten inches in diameter is cut in the bottom of the box. The motion is imparted to the box by a crank shaft upon which plays a pitman, hinged to the box as shown above. The cover fits down snugly into the box, and is held in place by a strap of iron bent as shown in the engraving and provided at the ends with knobs of india-rubber which press upon the outside of the box, holding the cover down. The cabbage or roots to be cut are placed in the box, the cover pressed down upon them, and then, by the revolutions of the crank shaft, the box plays back and forth over the diagonal knives. The latter may be set to cut more or less rapidly, as desired.

Rebecca's Garden.

EMILY H. LELAND, WISCONSIN.

Rebecca was the daughter of one of those farmers who are always in such a hurry with big jobs that they have no time for "bothering" with a garden; one of those farmers who, instead of taking a little time to plant strawberries, currants, raspberries and grapes, had rather eat dried-apple sauce all their lives—and even dried-apple sauce is much too good for them, in my opinion.

One day there came to Rebecca's home a wonderful flower, fruit and vegetable catalogue. Rebecca's father looked it over, after chores were done, and declared that it was "mighty easy to grow such things—on paper," and then he tossed it into Rebecca's lap and tipped back in his chair, and calculated how many tons of fat pork he was going to add to this scrofulous world next shipping-day.

Rebecca studied the catalogue by day and dreamed of it by night. She had none of the juvenile magazines and weeklies that are such a delight to many children, for the County Bugle-blast and a Sunday-school paper made up the literature of the family, and so this bit of new reading was very precious to her, illustrated as it was by roses as large as saucers, and strawberries almost as big as her little fist. She read every word, from the description of hot-beds and cold frames in front to the list of garden-tools and fertilizers at the back. Then she wrote out, just for fun, a list of the things she would like. She was quick at figures, and added up the column while rocking the baby to sleep. The amount was only fifty-eight dollars and sixty cents. Rebecca laughed (for she enjoyed a joke as well as anybody), and then she wrote down the things which she felt she *must* have:

1 dozen potted strawberry plants	$0.75
6 white currants	75
6 black-cap raspberries	50
1 packet pansy seed	10
1 packet sweet peas	5
1 packet mignonette	5
Total	$2.20

Because it was a two-dollar order the twenty cents would be discounted, and this suited Rebecca's purse exactly, for she had only two dollars and ten cents, the two dollars being a birthday gift from an aunt after whom she was named.

It was now early in April, and as it was spring vacation in the district school, Rebecca had plenty of time for her enterprise. First, she must secure a little land. So one night after supper, when her father had received the money for fifteen big black hogs, and was feeling rather cheerful, Rebecca made known her wish.

"Want a place for a little trash, hey? Well, if you'll clear it up and keep it cleared up, you may have a patch out there back of the woodshed."

"As big as this room?" asked Rebecca, sagely.

"Yes, but not a mite bigger. The more ground the more weeds, ye know."

"Thank you, Pa! I'll look out for the weeds—just see if I don't;" and Rebecca flung her arms about her father's neck, kissed his tanned cheek in the exuberance of her gratitude, and skipped away to write her order to the catalogue man. Kisses were rather rare in Rebecca's family, and that light, warm touch on his cheek somehow made the world seem very bright and sunny to "Pa Brown."

By sunrise Rebecca was at work on her "patch." The clearing was not a pleasant task, for the spot had been a dumping-place for old shoes and broken dishes, and general rubbish; but Rebecca had a shovel, a rake, a wheel-barrow, and a pair of stout, enthusiastic arms. By noon, in spite of stops for baby-rocking and potato-paring, the patch was cleared and its dimensions proclaimed by sticks from the wood-pile, sharpened and driven into the ground.

That afternoon it was a happy little girl who walked a mile and a half to the post-office to dispatch a precious letter. Five cents for the money-order and two cents for a stamp, left her just three pennies—for luck! After supper—for April suppers come early in the country—Rebecca had time to wheel four loads of well-rotted manure from the barnyard and spread them over that portion intended for the berries and currants, and she made one corner particularly rich for the pansies.

The next morning she was up and out again with the sun. But had the fairies been at work in this sober old backyard? For there was her garden all beautifully spaded from end to end, and raked as smooth as a floor.

"Oh, Pa Brown, what *have* you been doing?" she called out to her father, who was scrubbing his face and hands at the wash-bench on the back porch.

"Oh, I thought I'd give you a little send-off—just a little starter, ye know," answered Pa Brown from the depths of crash towelling; "but I ain't going to foller it up, mind ye!"

"Of course not! *I'll* do the follering up, I guess. And thank you, ever so much, Pa!"

"You're welcome," said Pa Brown.

In three days Rebecca's package of plants and seeds arrived at the post-office, and the bliss of opening it, examining the already freshly-budding things, and finding an extra packet of asters among the flower seeds, made a very bright spot in the little girl's sober life.

The weather of the following week seemed expressly tempered to the wants of freshly-planted things—cloudy skies, a moist air, and just enough sun-glimpses to keep the birds and violets in a happy frame of mind. Rebecca was a very new beginner, and she would have made the usual beginner's mistake of planting things too closely together if she had not studied her catalogue and obediently followed its wise commands. As for the pansy seeds, some little girls would have sown them two inches deep, and left them to die in the struggle to reach up into light and air; but Rebecca just scattered them on the surface of the mellow, moist soil, pressing them slightly with a shingle, and over them she spread a piece of old white muslin, with a stick in the center to raise the cloth slightly, and a stone laid on each corner to keep it in place. This cloth kept the soil moist and the wee baby pansies from being scorched to death by the sun, or blown out of the ground by cruel winds. The asters and mignonette were sown a little deeper, while the sweet peas went almost three inches under ground, and were given at once a row of alder twigs to climb on, so that their rootlets need not be disturbed at a later day. The strawberries were placed a foot and a half apart (although Rebecca could not help feeling that they must be lonesome at that distance from each other), and the currants and black-caps were set in straight rows on two sides, with four whole feet between them.

So Rebecca's garden was made. That was two years ago. This Summer her garden is as large as all the rooms in the house put together. For after Pa Brown had eaten the first four great strawberries from that little patch (Rebecca put them in one of the best china saucers, sprinkled white sugar over them and compelled him to eat them), Pa Brown took a tremendous fancy to small fruits, and also to a good variety of vegetables, and made a bargain with Rebecca to this effect—that he would order just as many things from that famous catalogue as she would agree to take care of. And as Rebecca agreed to take care of a good many things and is a girl of her word, you can now understand why her garden has enlarged so wonderfully, and can imagine, I hope, what a blessing it is to the whole family.

Handsome Square-Mesh Lace.

Make a chain of thirty-two stitches.

First row—One double crochet in the fifth stitch from the last, * chain two, pass two, one double crochet in the next *, repeat from star to star four times, one double crochet in each of the next six stitches, chain two, pass two, one double crochet in each of the next six stitches, chain two, pass two, one double crochet in the last stitch of chain, turn.

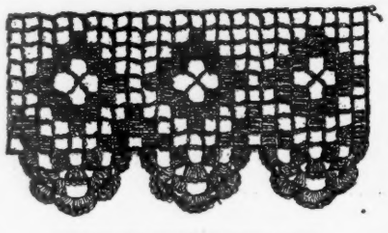
Second row—Chain three, two double crochet in two chain, one double crochet in each of the next four double crochet, chain two, one double crochet in the third double crochet, chain two, one double crochet in the next double crochet, two double crochet in the space, * one double crochet in the next double crochet, chain two *, repeat from star to star three times, one double crochet in the third stitch of the last chain, turn.

Third row—Chain five, one double crochet in the first double crochet, chain two, one double crochet in the next double crochet, chain two, one double crochet in the next double crochet, two double crochet in the space, one double crochet in each of the next four double crochet, two double crochet in the next space, one double crochet in the next double crochet, chain two, one double crochet in the next double crochet, chain two, pass two double crochet, one double crochet in each of the next four double crochet.

Fourth row—Chain five, one double crochet in the fourth double crochet, chain two, one double crochet in the next double crochet, two double crochet in the space, one double crochet in each of the next four double crochet, chain five, pass two double crochet, one double crochet in each of the next four double crochet, two double crochet in space, one double crochet in the next double crochet, chain two, one double crochet in the next double crochet, chain two; one double crochet in the third stitch of the last chain, turn.

Fifth row—Chain five, one double crochet in the first double crochet, two double crochet in the space, one double crochet in each of the next four double crochet, chain five, catch by a slip-stitch to the middle stitch of the five chain in the preceding row, chain five, one double crochet in the fourth double crochet, one double crochet in each of the next three double crochet, two double crochet in the space, one double crochet in the next double crochet, chain two, one double crochet in the third stitch of the last chain, chain six, catch by a slip-stitch in the same place as the last double crochet, chain one, catch by a slip-stitch to the lower corner of the third row, turn.

Sixth row—Work four double crochet in the loop made by the sixth chain, chain two, four double



HANDSOME SQUARE-MESH LACE.

crochet in the same loop, two chain, four double crochet in the same loop, one double crochet in the first double crochet, chain two, one double crochet in the next double crochet, chain two, pass two double crochet, one double crochet in each of the next four double crochet, one double crochet in each of the first three stitches of five chain, chain two, one double crochet in each of the three last stitches of the next five chain, one double crochet in each of the next four double crochet, chain two, pass two double crochet, one double crochet in the next double crochet, chain two, one

double crochet in the third stitch of the last chain, turn.

Seventh row—Chain five, one double crochet in the first double crochet, chain two, one double crochet in the next double crochet, chain two, pass two double crochet, one double crochet in each of the next four double crochet, two double crochet in the space, one double crochet in each of the next four double crochet, chain two, pass two double crochet; one double crochet in the next double crochet, chain two, one double crochet in the next double crochet, two double crochet in the space, one double crochet in the next double crochet; chain two, six double crochet in the two chain, chain two, six double crochet in the next two chain, chain two, fasten with a slip-stitch to the end of the second row just where it joins the third row, chain one, one slip-stitch where the end of the second row joins the first row, turn.

Eighth row—Six double crochet in the first two chain, one slip-stitch in the first double crochet, six double crochet between the third and fourth double crochet of the group of six, one slip-stitch in the last double crochet of the group, seven double crochet in the next two chain, one slip-stitch in the first double crochet of the next group of six, six double crochet between the third and fourth double crochet in the group, one slip-stitch in the last double crochet of the group, six double crochet in the two chain (this finishes the edge scallop), one double crochet in each of the next four double crochet, two double crochet in the space, one double crochet in the next double crochet, chain two, one double crochet in the next double crochet, chain two, pass two double crochet, one double crochet in each of the next four double crochet, two double crochet in the space, one double crochet in each of the next four double crochet, chain two, pass two double crochet; one double crochet in the next double crochet, chain two, one double crochet in the next double crochet, two double crochet in the space, one double crochet in the next double crochet; chain two, one double crochet in the next double crochet, chain two, one double crochet in the next double crochet, chain two, one double crochet in the third stitch of the last chain, turn.

Begin again at the first row.

("Double crochet"—thread over twice.)

Inexpensive Neck Ruchings.

Fancy ruchings for evening dresses cost from one dollar a yard up, and are as fragile as they are costly. White wax beads make a very charming and durable substitute. They cost eight cents a string and are of various sizes and tints. The best size is about that of a small pea. Very pale blue or rose color may be used on an appropriate dress, but for ordinary dark dresses of silk, wool or brilliantine the white are most suitable. Three strings are sufficient for neck and sleeves, with a dozen or two over to supplement the loss of an occasional bead. Leave them on the soft, strong thread on which they are strung, and sew the string between each bead firmly to a piece of narrow white ribbon which will cost about five cents a yard, and baste this into the neck and sleeves of your gown. For more ordinary wear you may make ruchings at a cost of about three cents a yard. Buy the coarse mesh grenadine or bunting of a slightly cream-colored tint, cut it on the bias two inches wide and baste into a double fold. At the edge of each fold sew a cord of gilt tinsel, which costs three cents a ball.

THE POTATO QUESTION IN ITS VARIOUS COMPLICATIONS.

The Home Doctor.

There are certain simple facts in regard to the care of the sick that every young girl should know before she is called upon to preside over a home of her own. Physicians say there are few women capable of making a poultice, a cup of beef tea, or a piece of toast properly. If one has never had the care of an invalid, there may be some excuse for not knowing practically how to make a poultice, but one can at least inform herself as far as the theory goes. A cold, clammy poultice is positively harmful.

To make a linseed poultice, pour a quantity of warm water into a tin basin, stand on the back of the range, and scatter in the linseed meal, stirring with a knife until of a proper consistency. In the use of the water you must be governed by the size of the poultice required. If it is too dry it will not hold together; if too wet, it is damp and uncomfortable. It should be moist, without being sloppy. Now take a clean piece of old muslin a couple of inches larger all around than the poultice is to be, spread it with the mixture, cover with another piece of muslin, and quickly baste over an inch all around. Do this without removing it from the hot dish, on which it should be carried to the bedside. If it is necessary to fasten it on, do this with folds of bandaging, and cover with a compress of flannel to retain the heat. A piece of oil silk is less clumsy and will keep moisture from the bed clothes.

There are many different formulas for preparing beef tea, but the simplest and best is as follows: Cover one pound of lean beef from the round with a pint of cold water. Have the butcher chop it fine as for Hamburger steak; beat it in the water with a silver fork for ten minutes; place over the fire, simmer for twenty minutes, strain and set aside to cool, in order to remove any little flakes of fat that may form. When ready to serve, make it hot, season with salt only, and serve with thin, brown toast, or little wafer crackers.

To Keep Cucumbers in Hot Weather.

Remove one head from a cider barrel and cut a square hole in it large enough to admit one end of a pipe made of four boards pinned together. One of these boards must be short enough at the lower end to afford a side opening. Stand the barrel in the cellar, or where it is to remain, put in the pipe (letting its lower end rest on the bottom of the

barrel) and then fit it to the head in such a way that it will hold the pipe in place. Now fill the barrel with strong brine, completely covering the top head. A follower must be cut out and nailed to the end of a broom handle, and when it is desired to put the cucumbers in the brine they are pushed down in the pipe with the follower until the orifice at the bottom is reached, when they will float off into the brine and rise to the top under the cover. The advantage of this arrangement is that the pickles are never allowed to come in contact with the air, and the scum can be removed from the barrel on any occasion. In the fall, when the weather becomes cold, draw off the brine through a spile at the bottom and fill the barrel with fresh water to soak out the excess of salt. When the pickles are sufficiently freshened, draw the water and put in vinegar.

J. W. BAILY, Calcasieu Par., La.

Summer Fashions for Children.

Mothers will rejoice at the simple manner in which children's frocks are made this season, and far more becoming to the little maids themselves are the English smocks and Gretchen waists, than the elaborate French models which are but *fac similes* in miniature of the costumes worn by their elders.

If wee ones of two or three wear colors, they should be of the palest tints, and a good material for them is finely striped cotton goods combined with white cambric. The striped fabric forms the full skirt or slip, and is gathered to a deep yoke the back of which is striped and the front white, decorated with zouave fronts of cotton, edged with narrow embroidery. The full sleeves are of the cambric, gathered into a band at the wrist, finished by a tiny ruffle. At the tops of the sleeves are set on caps which give width to the shoulders. From each side of the back, just at the edge of the yoke, a sash end of the striped material starts, and these are prettily looped in the center. A more dressy frock for Miss Baby is of fine white nainsook or mull, which hangs full and straight from a Pompadour yoke of narrow tucking and fine insertion. The edge of the skirt has a deep hem, above which are two clusters of tucks. The neck and full sleeves are finished by small fulls of embroidery. All the hemming and tucking on these little gowns are nicest done by hand.

Girls from three to ten still wear white guimpes and sleeves in their gingham and percale dresses, so last summer's frocks will not look out of style, but for ordinary wear a pretty and simple mode of making, is a plain full skirt, merely hemmed, and a full bodice, the fullness of which is drawn into the center of the front and back. The neck is cut in a rounding outline, and finished by a plaiting of white lawn, arranged like a turn-down collar. The sleeves are slightly full at the top, with loose cuffs of the plaited lawn, that turn back and reach almost to the elbow. A sash of ribbon or of the material is worn with this little cotton costume.

For cool days the Scotch flannels, that are half wool and half cotton, make useful dresses made with a blouse waist dropping over in sailor fashion, bishop sleeves and kilt skirt. Pretty white gowns have separate guimpes and low pointed waists, formed of solid embroidery lapping in front. The skirts are of three-and-a-half breadths of nainsook, or mull, hemmed and ornamented only with three tucks. Two-inch-wide ribbon, of any desired color, is laid along the sides of the waist and point, with two small bows in front, and a long, flowing bow behind. Small bows are also placed on the shoulders.

Older girls, just entering their teens, have their wash dresses made with belted yoke waists and full sleeves, the yokes and tops of the sleeves being finely tucked; while the skirts are perfectly plain, being four straight breadths simply hemmed and reaching nearly to their shoe-tops. Plaid wool gowns are made up on the bias throughout, while smart cashmere or silk suits are in the Directoire style, either with a princess back, or the waist cut off short back and front and the side forms extended in long tabs. The front of the bodice is a short, half jacket, with velvet revers, and opens over a shirt waist of white India silk. The cashmere sleeves reach only to the elbow, from which white silk undersleeves come out in a puff and are finished by velvet wristbands.

For every-day use girls wear shoes of tan undressed leather and cotton stockings to match; but for dressy occasions, black silk hose and low patent leather shoes are the proper thing.

The Connemara or peasant cloak is the popular wrap for small girls, and this is made of light bright cloth, either striped or of a solid color. Misses' jackets vary little from those of last year, except that the very newest have short revers turned back from a vest of lighter cloth.

The round hats are large, with low crowns and projecting rims, rosettes of ribbon being the trimming for school and play, and large bunches or wreaths of flowers for best wear. Tiny maidens too, wear Empire bonnets, with poke-fronts, having flowers inside and flaring bows of ribbon on the crown. But for protection from the sun in the country, nothing is as good as sunbonnets, and these are made of heavy white pique and sheer lawn combined, and trimmed with lace edging. The back and cape are all in one piece and are of the lawn. The deep front is pique and is gathered at the top, while in the inside at the nape of the neck is formed a casing, through which a string is run and tied to regulate the gathers. The cape of the back is extended to the sides, to join the lower edges of the front, which is double. Narrow lawn strings are tied beneath the chin, and a bow of the same ornaments the top.

Turned down plaited frills of embroidered muslin come for the neck and sleeves of children's dresses, and little girls still wear white mull ties around their necks, tied in a great bow in front.

What are known as the "Lord Fauntleroy suits" are the most picturesque for small boys, and are much worn this summer. There are three styles. One consists of a sailor blouse of white serge or flannel trimmed with red or blue; and Jersey fitted knee-trousers. The blouse has a broad sailor collar of gay wool or surah that meets beneath a shield, under a bow of ribbon, while a deeply fringed sash is knotted about the waist and hangs at the right side. Black stockings and slippers and a soft felt hat complete this pretty and inexpensive costume. Another, is a very elegant little dress of black velvet or velveteen. The knee-breeches are close fitting, the jacket quite long, single-breasted and rounded at the lower front corners, while the sash is of crimson surah, finished by tassels. With this, are worn a deep collar and cuffs of white lace and a large black hat, trimmed with a bunch of ostrich tips.

The third and perhaps most useful style is a little suit of corduroy or tweed, having a Norfolk jacket, box-plaited and belted, and short trousers. A Tam O'Shanter cap, either knitted or of the same material as the suit, is best with this; and for riding or tramping, leggings of tan-colored leather and gauntlets may be added.

Refreshing Summer Drinks.

Ginger Water, which is simply water sweetened with molasses, with two tablespoonfuls of cider vinegar added to each cup of molasses, and the whole spiced with ginger, is a very palatable drink, and one which may be safely used by farm laborers unless indulged in too freely when overheated.

Cocoa Tea is healthful and inexpensive. It is made from the shells or nibs, which cost three cents per pound. Wet two ounces with a little cold water, and pour over them a quart of boiling water; cook one-and-a-half hours; strain and add a quart of milk heated to boiling. It should be slightly sweetened.

Strawberry Sherbet.—Crush one quart of fresh, ripe strawberries to a smooth paste; add the juice of one lemon and three pints of water and let it stand three hours. Then strain through a cloth over three-quarters of a pound of granulated sugar, squeezing the cloth tightly. Strain again through a fine strainer and set in a cool place until wanted.

Buttermilk.—Farmers' families seldom appreciate what a delicious and healthful drink they have in home-made buttermilk. It was the fashionable drink in New York last summer, and brokers, bankers and merchants indulged in it at three cents a glass, from street stands or wagons. Ice is not an essential where a beverage can be stood to cool in a porous earthen jar in a cold cellar or milk-room, such as belongs to every farm-house.

Oatmeal Water is the cheapest and one of the most healthful hot-weather drinks. It is simply oatmeal stirred into cold water, and allowed to settle before drinking. This is sold in New York at a penny a glass, giving the vender about ninety-nine per cent of profit. It makes a pleasanter drink if a very thin gruel is made, using one tablespoonful of oatmeal to a quart of water. Boil for an hour, strain, and let it get very cold. Still another improvement is to add the juice of one lemon, and two tablespoonfuls of sugar to each quart.

Ginger Beer.—A ginger beer costing about fifteen cents a gallon is a good standby. There are many different recipes for this, but the following is one of the simplest. Pour four quarts of boiling water over three-fourths of a pound of white sugar; add the minced yellow peel of one lemon, and an ounce of ground ginger. Let this stand covered until lukewarm, then add the juice of the lemon and a gill of good yeast. Mix thoroughly, cover and stand in a warm place over night. Next day strain, bottle and cork, tying down the corks securely. Lay the bottles on their sides in a cool place.

Raspberry Vinegar is a luxury that may be indulged in by families living in the country who have an abundance of fruit. Put four quarts of berries in a stone jar, with one quart of the best cider vinegar, and mash to a paste with a wooden pestle. Set in the sun twelve hours, and then place all night in a cool place. Strain off the juice the next day and pour it over four quarts of fresh berries. The second day strain, and to each quart of the juice allow one pint of water and five pounds of granulated sugar. Heat over a slow fire until the sugar is dissolved. Bring to a boil slowly, skimming off the scum. As soon as it reaches the boiling point, strain and bottle while warm, sealing the corks with wax. This syrup, or cordial, although too expensive for ordinary use, is a delightful drink for summer-evening gatherings. Put two tablespoonfuls in a glass of ice-water, and embellish with any fruit in season.

Lemonade is economical if the opportunity of making a lemon syrup is seized when lemons are cheap. Grate the thin yellow rind of twelve large lemons over six pounds of granulated sugar. Add two quarts of water and stir over the fire until the sugar is dissolved. Bring to a boil and boil until it thickens, skimming as fast as the scum rises. Add the juice of the twelve lemons and simmer fifteen minutes longer. Bottle and cork tightly, and keep in a cool place. Two tablespoonfuls of this syrup will make a delicious glass of lemonade. We must agree with tipplers that the lemonade of church fairs is usually not a "nice drink." But if you will rub the rind of a lemon with a lump of cut sugar, extract the juice of half a lemon with a squeezer that will keep out the pulp and seeds, fill up the glass with cold water, add a strawberry, two or three luscious blackberries or a stem of currants, and will further furnish it with two straws, you will have a drink pleasing to both eye and palate. Lemonade made as above, substituting tea, weak or strong, according to taste, for water, is both stimulating and refreshing.

Egg Lemonade is the very quintessence of all that is delicious in the way of a refreshing and nutritious summer drink, if rightly made—which it very seldom is. We have our recipe from a gentleman whose friends declare that if in his course at Yale he acquired nothing else, he should be satisfied with the proficiency it brought him in the manufacture of this beverage. The necessary utensils are a lemonade glass and shaker, with a small wooden pestle, all of which will cost fifteen cents at a house-furnishing store. Extract the seeds from half of a large lemon and put it into the glass with three lumps of sugar. Press and work with the little pestle until the juice is extracted and the skin soft. This draws out the zest from the rind and adds greatly to the flavor. Add two tablespoonfuls of sugar, as much finely cracked ice, and a raw egg, and fill nearly full with cold water. Invert the tin shaker over it and shake well. It cannot be made at its best without ice, and it is necessary that this should be very finely cracked. Put two straws in the glass when you hand it to your friend, and don't begin the task if the crowd is a large one unless you are strong of arm and steady of purpose. It cannot be made satisfactorily in large quantities.

The Best.—I deem the AMERICAN AGRICULTURIST by far the best of all agricultural journals published in the English language.

C. G. SCHULTZ, Editor Skordemannen, St. Peter, Minn.

The Liberty Bell.

A Story of the First Independence Day.

AGNES CARR SAGE.

"Hey, there, Patches! where did you get your dog?"

The tone was half insulting, and the lad, whose cheeks had reddened at the allusion to his worn, though neat and well-mended attire, glanced angrily at the richly-dressed young aristocrat, although he answered quite civilly, "If you are speaking to me, I raised him from a pup;" while his hand dropped caressingly on the head of the noble mastiff which stalked sedately by his side.

"What will you take for him?"

"He is not for sale, Master Cathcart."

"I WISH HIS APPETITE WAS LESS."

"Not if I offer you two guineas for him?"

"No, nor three. Penn is worth his weight in gold;" and the boy tightened his hold on his pet's short hair as if afraid he might be taken away without his consent.

But now the first speaker's manner became more conciliating, as he urged, "See here, Harding, don't be a fool. I have a fancy for your beast, so take these and call it a bargain." And he drew four gold pieces from his pocket and held them out where they glittered temptingly in the July sunshine.

"Nay, nay, as I told ye, my dog is not for sale, so go your way and let me go mine."

"Miserable Yankee! That I will not!" cried young Cathcart, who never could brook opposition. "I want the mastiff, and I've half a mind to send my father's men to confiscate him in the name of his blessed majesty King George. Such as you have no business with a valuable thoroughbred, though doubtless his meat is never paid for."

"Never paid for! What do you mean by that?" asked Harding, turning pale with rage.

"Even what I say. 'What's bred in the bone will come out in the flesh,' and verily it looks suspicious when the bantling of a jail-bird can keep a big dog, while his father lies in the Debtors' prison," sneered the English boy.

"Zounds, but such insults can only be avenged by knocks!" cried Harding, doubling his fists and approaching his tormenter, who, however, contented himself with waving a short stick he carried, and shouting, "Keep off, sirrah! How dare you lay finger on the son of a British officer and the grandson of a lord! You shall be reported and locked up for this."

"RING, GRANDPA, RING."

"A fig for your king's men! I am an American, and Americans dare to fight, as you and your fine tory friends will soon learn;" and the peppery little Yankee struck out boldly from the shoulder, while Penn, seeing his master's warlike altitude, showed his teeth in a low, ominous growl.

Another moment and the hot-headed youngsters clinched and would have been down in a rough-and-tumble fight, had not an old man, in plain Quaker garb, suddenly appeared on the scene and separated them.

"Peace, there," he said, laying a hand on the shoulder of each and gazing sternly into their flushed, angry faces. "Is this a time for fighting and brawling in the public streets, when the country is trembling on the verge of a great crisis? Thee knows better, Nelson Harding; while as for thee, Reginald Cathcart, thy father's rank should restrain thee."

Harding's eyes still flashed, but Cathcart, with a glance at the mastiff, whose deep growls like distant thunder made him glad of any chance to withdraw from the encounter in an honorable manner, responded, "True, sir. I fear I did forget myself for a moment. *Noblesse oblige*, of course. So, if my antagonist is satisfied, I will bid you both good-day;" and having brushed the dust from his silk camlet suit and lace ruffles, this small sprig of English nobility marched off with the haughty air he fancied so well became his station.

"What would Margaret Harding say did she know thee

"PEACE, THERE."

had been exchanging blows thus publicly with a royalist?" asked the old Friend.

"My mother would regret it, no doubt," replied Nelson, "but, Grandpa Darrah, he insulted my father as well as myself. He called him a — a — jail-bird;" and a great sob rose in the boy's throat.

"Wrong, indeed, was that," said the aged man. "But two wrongs never made a right, and 'tis likely the boy knew not that Benjamin Harding was unfortunate, not wicked. Long and bravely he struggled to support his family, and when reverses came it was a cruel thing to consign him to the Debtors' prison. It was the work of an enemy."

"Aye," cried Nelson, "and for, seemingly, so small a sum, too! It is large enough, however, to mother and me who are laboring to pay it off. We buy as little as possible, but the sum increases but slowly in the 'debt box,' and sometimes I fear the mother will die ere we can set my father free. She pines sadly for him."

"Aye, aye," sighed the Quaker, "truly we have fallen upon troublous times, and the hand of the oppressor is heavy in the land! Who would know our peaceful Philadelphia with the red-coats turning everything topsy-turvy! I pray we may soon throw off this British rule!' By the way, the Continental Congress has been considering the question for the past two days, and to-morrow their decision is to be made known. Wilt thee be at the State House, Nelson Harding, to receive the first news

from the doorkeeper and give me the signal whether to ring the great bell or no? I will pay thee a shilling for the job."

"Gladly will I be on hand, Grandpa Darrah. You think they will really dare to declare our independence?"

"Many say not, but I believe they will. There are great and wise men in the Council, and then the motto on the old bell I have rung so many years seems verily prophetic—'Proclaim liberty throughout all the land to all the inhabitants thereof.' The Lord grant it may do it;" and the aged Friend's serene countenance glowed with enthusiasm.

"Oh, I hope, I hope it will," responded Nelson; "but now I must away home at once. Good-day, Grandpa. Come, Penn," and off he scampered with the huge mastiff at his heels. The little home of the Hardings in Letitia Court was plain and modest in the extreme, and, as the pale, fragile housewife set the frugal dinner on the table, Nelson thought she seemed more downcast than usual.

"What is it, mother?" he asked. "Has anything gone wrong?"

"Nothing new, only the landlord has been for the rent, and I have had to draw on the debt box again, and each time it seems like a step further away from your father. Oh, I wonder if we shall ever, ever accomplish his freedom!"

"Of course we shall!" cried Nelson, more hopefully than he felt. "Cheer up, Mammy! I am growing larger every day, so can soon earn more; and only just now Grandpa Darrah, the bell-man, promised me a shilling if I will wait at the State House door to-morrow and give him the signal if independence be declared."

"And if it is, how your poor father will fret and fume at being shut up and unable to fight for his country. He was always such a true patriot!" And the unhappy woman turned away to her sewing, with a heavy sigh. A lump, too, arose in Nelson's throat, and he ate but a small portion of his savory stew, giving the lion's share to Penn, who enjoyed it with hearty gusto.

As he finished the last morsel Mrs. Nelson looked up. "That dog eats as much as two men," she said.

"But he is such a grand, noble fellow, mother, and I love him so."

"So he is, dear, but I wish his appetite was less;" while into Nelson's mind darted the young Britisher's words, "Such as you have no business with a valuable thoroughbred."

Was it true? Ought he to sacrifice his dear companion and playmate for the sake of the father languishing beneath the shadow of the law? He tried to put the thought away, but the idea haunted him and made him wretched whenever Penn looked up in his face with his soft, brown eyes or licked his cheek with his warm, red tongue, as though to ask, "What ails you, little master?"

But when, in the dead of night, Nelson awoke and heard his mother sobbing in the next room and felt sure the four guineas would appear to her like four seven-league strides toward her husband's freedom, he determined that, although he could not put up with Reginald's overbearing manner, he would go to Captain Cathcart, who, in the phraseology of that day was said to be a "genial, whole-souled Old England man," and offer him the mastiff on his son's terms.

The next morning, however, he had little time to consider his resolution, for he had to be off early to the State House, and already the streets were filled with eager, excited groups, while a feeling of hushed expectancy seemed brooding over the quiet city of brotherly love.

No fairer day ever dawned than the 4th of July, 1776, while, prompt as Nelson was, the old bellman was before him and ready enough to welcome the boy to his little belfry and to point out the Congressmen as they arrived one by one at the State House; for the old Friend's Quaker garb covered a truly patriotic heart, while his genial nature made him a general favorite, and he was dubbed "Grandpa" by half the town.

First came Richard Henry Lee, the Virginia member who first brought forward the resolution to proclaim the American colonies free and independent States. Next young Thomas Jefferson, carrying a roll of manuscript, the draft, no doubt, which he had drawn up of the famous Declaration. Then Samuel Adams, the "Father of the Revolution," in his customary suit of reddish brown; John Hancock, the president of the Congress; Charles Thomson, the secretary, who held the position for fifteen years, and plain, sensible Benjamin Franklin; while, following in rapid succession came Roger Sherman, William Ellery, Charles Carroll and the rest of the illustrious fifty-six.

"A vastly fine, thoughtful set of men, are they not, Nelson Harding?" asked the bellman.

"Yes, yes," cried the boy, flushed by the excitement of the moment; "and I feel sure they will do whatever is best for the country!" and descending he took up his stand close to the State House door and patiently watched and waited, while Chestnut street became one mass of surging humanity and the sultry July sun beat down with unrelenting fervor. Men wearied and wandered off to the State House Inn or Old London Coffee House; children lifted up their voices and wept, and women fainted from the heat and were borne off by kindly hands; but still our loyal little Casabianca kept his post, although the hours dragged by on leaden wings, and often from above came down the despondent tone of the old bell-man, whose hope was beginning to waver, groaning, "Oh, they never will do it! They never will do it!"

About noon, though, there was a slight interruption, for a determined four-footed creature came, making its way through the crowd, and with a cry of pleasure Nelson recognized Penn, bearing in his mouth a small basket, in which Mrs. Harding had packed a light lunch for her son. With a joyful bark, the dog discovered his master and laid his burden at his feet, while, as the lad patted his faithful creature's head he moaned, "Oh, Penn, dear Penn, how can I ever bear to part with you! If only there was some other way to help my father!"

The bread and fruit, however, soon revived the boy's flagging spirits, and when Penn trotted off with the empty basket he was once more the loyal young American, who had forgotten his private troubles in suspense for his Country's good; and soon after two o'clock the great doors swung open and the keeper whispered a few words in his ear. Then, with a glad cry and his blue eyes dancing, Nelson bounded out in the street, and clapping his hands shouted: "Ring, Grandpa! Ring!" and instantly the old man seized the rope attached to the ponderous tongue and struck it with all his might against the side of the bell, sending the iron music floating forth on the summer air, joyfully proclaiming, "Liberty throughout all the land, to all the inhabitants thereof."

The debtors heard it in their gloomy cells, and one, at least, longed to be able to join in the struggle that must follow.

Margaret Harding heard it and thought, "Oh, that it would ring freedom for those in the grasp of the law!" And Reginald Cathcart heard it and laughed contemptuously, saying, "Let the high and mighty Yankees declare all they like! They will find it another matter to maintain their independence, with their rag-tag army against our king's gallant men!"

But what a burst of acclamations went up from thousands of throats, while couriers and post-boys were dispatched in all directions with the glad tidings! Bonfires blazed on every side, cannon roared, and by evening the whole city was one carnival of banquets, gay illuminations and mutual congratulations.

Grandfather Darrah was so jubilant that he doubled Nelson's well-earned shilling, and with a fleet foot the boy sped home to throw the silver in his mother's lap; while the happy smile that irradiated her face as she dropped it into the Debt-box made his heart leap, and he thought, "If two shillings can make her so glad what would she say to four golden guineas!" Then, while carried away by the spirit of the occasion, he hurried at once into the yard, indulged in a brief moan over his pet, and then bravely fastened a chain about Penn's neck and started with him for the British barracks, which lay a short distance outside the town.

At the entrance, however, of the large, three-story brick building, where the officers had their quarters, he encountered a young lieutenant, in a scarlet uniform, who informed him that Captain Cathcart was particularly engaged and had given strict orders not to be disturbed.

"Then—then, may I see Reginald Cathcart?" asked Nelson, bringing out the detested name with an effort. "Yesterday he said he would like to buy my mastiff; and now I am ready to sell him, if he be of the same mind."

"As a sacrifice on the altar of Liberty?" asked the young officer scornfully, but coming nearer the truth than he imagined. "Well, you can't do it to-night, for Master Cathcart has gone into the town. Call in the morning, if you please; but I doubt if after to-day, he will want Yankee dogs of *any sort*."

The Englishman's contemptuous tone and words made Nelson's blood boil; and quickly retorting, "Take care, the Yankee dogs you so despise may yet nip the heels of all redcoats!" he turned and hurried off with a swelling heart, thinking that after all it was too hard lines to have to give up his darling Penn to the enemies of his country; and yet who else did he know now, in these uncertain times who would pay four guineas for an animal that ate "as much as two men!" He scarcely heeded the brilliant fires and decorations in the street but hastened home, where he was met on the threshold by his mother, her manner betraying a new and strange excitement.

"What is the matter?" he asked, fearing some fresh misfortune; but for answer she only flung wide the door of the living room, and he beheld the figure of a man sitting in the soft light of the home-made candle. He looked, and rubbed his eyes and looked again. Could it be? Yes, there was no mistaking the blond hair and blue orbs so like his own; and in another moment his father's hand was on his shoulder and a familiar voice sounded in his ears, saying, "My dear boy, this is a rarely happy night for us, for in honor of this glorious day, our wise rulers have opened the Debtors' Prison and set all the prisoners free."*

"Huzza, huzza!" shouted Nelson, tossing up his hat and hugging his father, mother and Penn by turns. "I shall love that old Liberty Bell all my life."

But it was not until the trio were gathered about the supper table that Nelson realized the fullness of his happiness; and then suddenly, he threw down the spoon with which he was eating pop robins and milk, and exclaimed, "Oh, hip, hip, hurray! Now, I won't have to sell Penn!"

"Sell Penn! What do you mean?" asked his mother; and in a few words he told her of his recent resolution, and how it had been frustrated. As he finished, tears glistened in Mrs. Harding's eyes, while his father said, "No, my generous boy, there is now no need of the sacrifice, but you and your pet shall stay and guard the mother while I go to join the continental army and fight for America and her new-born independence."

* A historic fact.

How to Dry Plants.

THE DOCTOR.

Plants are dried between papers; paper that is not glazed but soft and porous; this should be made ready for use in folds and driers. Folds are single pieces of paper, folded once, like a sheet of letter paper. Driers are made of six to ten of such papers laid together, and stitched lightly to hold them in place. The papers should be about thirteen inches long and twelve inches wide, and may be old newspapers, if not stiff and glazed; some paper that grocers use answers well. As we wish to get along with as little expense as possible, it is better to try to find old newspapers that will answer. Cut several sheets of stiff pasteboard to the size of the papers, or an inch larger, each way. If not to travel, boards of the same size will answer, and are often more readily procured. These may be half an inch thick, and kept from warping by a cleat at each end. In collecting, a tin box of some kind will be found very useful. Any box twelve or fifteen inches long, with a lid the whole length, will answer. If one is to be made by the tin-smith, let it be oval in section, without sharp corners; a convenient catch for fastening, and a loop at each end, through which to run a strap, for carrying it over the shoulder. Plants will keep fresh in such a box, very slightly sprinkled, for two or three days. It is well to have

BOTH BOX AND PORTFOLIO;

the box for specimens to be examined, and the portfolio for those that may be dried at once. Two heavy pasteboards of the size mentioned, with straps to go around the sides, will answer as a portfolio as well as one with a hinge at one edge, like the cover of a book. If you wish a portfolio that will last for years, cover the pieces of pasteboard with stout, unbleached cotton cloth, applying it firmly with stiff flour paste on all sides; turn as it dries to prevent warping. When thoroughly dry, cover the cloth with a coat of paint, and if it seems to need it, apply a second coat. Pasteboard thus treated will be water proof and very strong. I have a set of boards thus prepared,

that stood the wear and tear of wagon and pack-mule transportation across the continent and back, and would answer for another similar trip. I don't say that all this is necessary, but it will be found very satisfactory to have articles that will stand wear and tear.

TOOLS NEEDED:

A stout knife that will not be spoiled by digging, and a pocket-knife to cut the stems of trees, shrubs, etc.; some carry a trowel to do the digging. Place a number of folds of paper in your portfolio, take some twine and a memorandum book, paper and pencil in your pocket, and you will be ready to start. If to be gone all day, a lunch wrapped in a strong paper may be "handy to have" in the tin box.

IN COLLECTING PLANTS,

the specimen should represent all parts of the plant as far as possible, within the size of the paper above given. Small plants may be taken sometimes complete, including the root, or a portion of it. The upper and the lower leaves of a plant are often quite unlike, and both kinds should be taken. If the flowers, and the ripe or full grown fruit, which you know is the seed vessel, can both be collected on the same specimen, get them; but it is often necessary to go a second time for the fruit, and if there is any doubt about finding the same shrub, or other plant, mark it to make sure of it. A strip of white cotton cloth, long enough to flutter in the wind, makes the most conspicuous mark. Specimens to be taken home fresh should be laid in the box. Then for the others, lay down one of the covers of your portfolio, and spread a fold upon it; spread upon that in as natural a manner as possible and cover it by bending over the other half of the fold. Then lay down another fold of paper, and place another specimen, and so on. If any of the specimens are large and coarse, and likely to injure those above or below them; it is well to place some empty folds between two of those containing specimens. When you have returned from a collecting tour, attend at once to the specimens in the portfolio. Lay down a board, then a drier, then upon this a fold from the portfolio, containing a specimen; then another drier, and so on, alternating folds with specimen, drier, and so until all of the specimens of that day's collecting are put up between driers. With each specimen as you put it on to dry place a label of any kind of paper of convenient size. On this write the botanical name, if you have it, then the several common or local names by which it is called; next the locality, such as marsh, sandy, etc.; then the town, county and State, with date, and name of collector.

In drying at home no press is needed; weights are much better. The weight should be fifty to one hundred pounds according to the number in press. The handiest weight is to get some store boxes, nail well, put rope handles in the ends and place in these stones, brick, old iron or other material, which should not project above the edges, in order that one box may be, if needed, set upon another. The next day the plants must be changed, making up the pile as before; a drier, a fold, another drier, another fold, etc., finally placing on a board and weight. This changing may be done every day for two or three days, and then not so frequently. The feeling of the plants will tell when they are dry enough. Observe, in changing, the specimens are always to be left in the folds. When dry, stock up the folds without driers, and with a moderate weight to keep them flat. Spread out the driers in the sun until they are quite dry; on a damp or rainy day, dry them under and around the kitchen stove. Collect all the plants as they come into flower, no matter how common or homely they may be. If you live on a farm, or have a garden, you should know every weed that troubles the crops.

"Oh, it is no use diggin', you'll never git that woodchuck."
"See here, mister, I've got to git it; the minister's coming to our house and we're out of meat."

Blue-Tinted Paper.

The pale blue-tinted paper largely used for commercial purposes, and which was still more in vogue some years ago than it is now, had its origin in a rather singular manner. It chanced that about the year 1790, on one domestic wash-day, the wife of an English paper manufacturer left her tubs and went into the factory with an old-fashioned blue-bag in her hand. This she accidentally let fall into a vat of pulp, but thought no more about it and never mentioned it. Great, then, was the astonishment of the workmen when the paper came out a peculiar blue color. The master was vexed enough with what he considered the carelessness of his employees, while his good dame kept her own counsel.

The lot of paper was considered unsalable and was stored away for four whole years. At length, however, Earl consigned it to his London agent, with instructions to sell it for whatever it would bring. As luck would have it, the blue sheets were accepted as a happily designed novelty and quickly disposed of at a high price, while Mr. Earl received an order for another large invoice of the same. But this was somewhat of a dilemma! He had no idea of the manner in which the paper had become blue, and in his perplexity mentioned the matter to his wife. She must have laughed heartily, but she promptly enlightened her bewildered lord, who, in his turn, kept the simple process secret and was for many years the sole manufacturer of the blue commercial paper, and doubtless reaped a rich harvest thereby. By such slight accidents are inventions often made and fortunes fall within one's grasp.

A Quaint Chinese Legend.

Long, long ago, in the time of the Shang dynasty, 1,500 years before Christ, there lived in the Province of Shansi a most wonderful sorcerer, named Chao. To this dealer in mysteries there came, therefore, one day, a Mr. P'ang to consult the oracle; and Chao having divined, by means of a tortoise shell diagram, informed him that he had but six days more to live. Naturally, Mr. P'ang was much dismayed, and in his distress he resorted to the fair Peachblossom, a young lady who had also acquired quite a reputation as a sorceress. Her divination yielded the same result as Chao's,—in six days P'ang must leave this world, unless she could avert the catastrophe by her magical powers. However, she gave the poor man a little hope by promising to attempt his rescue; and fortunately she was successful, so that on the seventh day after, Chao was consumed with astonishment, mortification and rage when he met P'ang taking his evening stroll as hale and hearty as ever, and learned that there was a greater magician in Shansi than himself. He felt sure his reputation would be ruined unless he could get rid of his rival, so he at once began to plot against her life. First he sent a go-between to Peachblossom's parents to inquire if she was still unmarried. The answer was in the affirmative, at which the wily sorcerer befooled the father and mother into believing that he had a son who desired a wife, and ultimately induced them to engage Peachblossom to this mythical youth in marriage. The wedding cards were interchanged, but the crafty old Chao selected the most unlucky day possible for the ceremony,—a day when the "Golden Pheasant" was in the ascendant; for he knew that then as surely as the bride entered the red chair, in which she was to be conveyed to meet her husband, the spirit bird would destroy her.

But he reckoned without his host, for the wise Peachblossom knew this as well as he and feared not. "I will go," she said; "I will fight and defeat him." When the wedding morning came, then she ordered that a quantity of rice be thrown out before her door; which was done. This the Golden Pheasant saw, and hastened to enjoy, and while his attention was occupied in picking up the snowy grains the fair Peachblossom stepped into the bridal chair and passed on her way unharmed.

And this, then, according to the Mongolians, is why we still throw rice after the bride.

FROM NEAR AND FAR.

Weather and Seasons in India.

India lies between the parallels of 8° and 30° north latitude, and the place where I now reside is in the 28th parallel, about the latitude of Tampa, Fla. The sea breezes have little effect in the greater part of India, as on the western coast there are the Ghats or low ranges of mountains which shut off the wind in that direction, and there is no southern wind except on the immediate coast. If there was, it would have but little influence on such an extent of country. The only part of the year when there is wind is in the hot season, and then the stronger the wind the hotter the air, as it carries along the waves of heat over the burning sands. In the great plains remote from the sea, the heat during the hot season is often very intense, sometimes rising to 125° in the shade and 180° in the sun, but this extreme heat is seldom and lasts only for a short time. Exposure in the sun at this season is very dangerous to Europeans until they become accustomed to it. The railway men pay little attention to the heat and go into the sun often with only the regulation cap on their heads. The native constitution seems to suffer but little from the heat. They dread the cold more, as they have not the means to buy proper clothing. The sensation of cold here to Europeans is as great as that from the extreme heat. When the thermometer ranges from 70° to 80° at mid-day we wear our woolen garments, and at night indulge in the covering of several warm blankets.

Bareilly is 823 miles from Calcutta and 1,007 from Bombay by rail. Being so far north and within sixty miles of the foot of the Himalaya mountains, the climate is made cooler than a little farther south. The temperature for 1886 was as follows:

	MAXIMUM	MINIMUM
January	77	57
February	84	58
March	92	68
April	107.5	64
May	105.5	78
June	109	79.5
July	95	80
August	95.5	79
September	95	77
October	93	74.5
November	86	58
December	78	52

This is not a great range of temperature and makes the climate excellent for agricultural purposes. The seasons for agriculture are two: the rainy season, when crops are sown in June and July and harvested in September or October, and the winter season when crops are sown in October and November and harvested in March or April. In the hot season, which lasts from March to June, nothing is grown in the fields. Vegetables and fruit are grown in gardens by irrigation. With the beginning of the rains a new life commences. The parched South seems to be awakened from sleep. Vegetation appears everywhere and animal life also revives. Frogs, toads, lizards, insects and myriads of creeping things come out of the baked earth, where they have been entombed for months. The rains sometimes fail, and famine is the result and starvation to millions, so the rains are looked for with great anxiety.

I. L. HAUSER, Bareilly, India.

Farming in Southern Colorado.

The mammoth irrigation ditch being constructed on the south side of the Arkansas river will be forty-five miles long and twenty feet wide on the bottom, at its source about sixteen miles west of Pueblo. This canal will open up many thousands of acres for cultivation. Most of the land is owned by the company that is constructing the irrigation ditch. There are many farms along the creek bottoms, but not enough to supply the growing demand for farm produce for our city or the mining towns around. The last was a remarkably favorable winter, and the energetic farmer who irrigated his fields last fall was able to plow beam deep and not wait for our spring rains, which are always late in getting here in this dry country. Farmers that wanted to, had all of their plowing and wheat, oats and alfalfa seed sown by the first of April. But there are a few who are always late in getting their spring work done. In the low pastures that were well irrigated last fall there was good green grass March 20, and they could by forcing have been used a week earlier. Alfalfa meadows were green and looked nice much sooner. A well seeded field of alfalfa well taken care of will yield eight to ten tons of cured hay in a season. Ten to eighteen dollars per ton is the usual price, according to whether it is sold in stack at the farm, or baled and delivered in the city.

Corn and all small grains do well here. Where we have irrigation we do not have to wait for the clouds to come and then the sun to dry things, but go on and do our work, letting the water on one field, and when that is drying we work another We can always have dry roads about the farms and a luxuriant growth close beside it.

W. F. WING, Pueblo Co., Colorado.

Ramie Prospects.

The official report of last September's ramie competition in Paris adds little to the unofficial notices. The exhibition was a failure, contributing nothing to the solution of the problem which has piqued the scientific and manufacturing world for over half a century. The machines most approved in practice were conspicuous by their absence. The prizes offered were not awarded, but gratuities were given to the three contesting machines, including one from the United States. A further competition is to take place during the present Exposition, and it is hoped that larger prizes may attract a more serious concurrence.

Meanwhile a glance at the official report may be of some interest. It is suggested that too much should not be expected of the ramie plant. It will neither replace silk, wool nor cotton, says Mr. Imbs, the reporter, but it may be substituted for flax and hemp in many of their applications. Yet to do this much it must be produced under the best economic conditions, and these conditions must be sought in tropic or semi-tropic regions. Right here it may be remarked that portions of California and the desert regions of Arizona, Colorado and New Mexico are wonderfully adapted to ramie culture, and hence the extreme importance to the United States. Even on the despised alkali lands two or three crops a year may be gathered.

The report recognizes the *degommage* of the ramie fiber as the most serious obstacle to be overcome. The one system exhibited at the September competition, whatever its merits, involved too great expense. Furthermore, all known systems for extracting the ramie gum injure the fiber, reducing it to a condition like waste silk in some cases, and in others to that of vulgar oakum. Mr. Imbs, therefore, recommends the discontinuance of *degommage*, and the use of such decorticating apparatus only as will remove bark and envelope without disturbing the parallelism of the fibers.

This suggestion is certainly not encouraging, for its adoption would practically remove ramie from the field. Neither does it seem to be necessary, for processes are already in use which accomplish imperfectly the object sought for. Much is to be hoped from human ingenuity in this respect, especially under proper encouragement. At present, circumstances are adverse, for ramie culture is not systematized even in its imperfections, and manufacturers cannot be expected to adapt machinery to the new fiber until it becomes a staple article of commerce, of fixed and unvarying grades. One prominent French writer suggests experiments with a view of evolving a new variety, of less gummy constitution, or with less tenacity of stickiness. Then, too, there is the chance of modifying the existing varieties by methods of planting, of manuring, cutting at special times, and the like. Certainly these hints are not unworthy of attention. The possibilities of the ramie fiber are so enormous that scientific painstaking has strong encouragement. W. H. W., Paris, France.

The Gulf Coast of Florida.

This section is specially adapted to the culture of staple crops, such as corn, cotton (long staple), oats, hay, potatoes—both white and sweet, peanuts, etc., while orange growing is profitable. But our specialty in fruit culture is the growing of peaches, pears and plums. The peach has almost no enemies here, and trees planted by old settlers, twenty-five to thirty-five years ago, are still thrifty and bear heavy crops annually. One tree near here, that was planted twenty-six years ago, bore last year twenty-two bushels of nice fruit, and others did as well. The early varieties ripen the latter part of April, and a continuous succession is kept up till October. One of my neighbors gathers ripe peaches from the trees seven months in the year. Men of moderate means can farm their lands and make a living while waiting for their fruit trees to come into bearing. Sweet potatoes produce 200 to 300 bushels per acre, and long cotton 300 to 600 pounds per acre (worth an average of about five cents per pound, in the seed). Tobacco culture promises to be very profitable. Wild lands can be bought at from $1.25 to $5.00 per acre; improved lands in proportion. Considerable land is yet subject to homestead entry. Many credulous ones have been fleeced by biting at the alluring baits held out by speculative land companies, but they deserve little sympathy. No one should expect to get a $100 lot for fifty cents. The best method is to come and select a suitable tract, then buy it; or get some one that is honest and reliable to select for you.

J. V. BURKE, Levy Co., Fla.

The Water Supply of Dakota.

The lack of water is one of the greatest obstacles to be overcome by settlers on the Dakota prairies. Wells occasionally furnish the desired article in generous quantities, but more frequently the amount obtained has proved inadequate during a dry spell in the fall. The place usually selected for sinking a well is on some low piece of ground or in the margin of a slough, but not five per cent of the wells thus placed are of any value. The next choice of location is upon some of the numerous "dry runs" which are to be found traversing the country in every direction, and as a rule these are proving to be very successful. The various burrowing animals, as the badger and pocket gopher, are generally credited with locating their habitations at such points that their burrows are sunk to a water vein, and many instances of success in getting water by wells sunk at these places seem to justify the theory. One man wished to enlarge his house, which was placed on a rise of ground or gravel knoll. He dug a cellar six feet deep, where an old badger burrow had been, and the next morning he found two feet of water in the excavation. Many other instances of getting water from wells on high ground show that the chances are fully as good as in low locations, if not better. Another source of supply is by means of cisterns, which are filled with water that falls on the roofs of dwellings or barns, but these are few, as our buildings are usually small and covered with tarred felt or hay, neither of which is a good water conservator. Artesian wells are sunk in almost every county, and in Central Dakota are, as a rule, very successful. Some of them are capable of sustaining a column of water 100 feet high above the surface of the ground; but the depth—from 900 to 1200 feet—makes them cost from $4000 to $8000 each, which is more than the average Dakota farmer, or even a community of farmers, can afford to pay.

The future and most sensible method of obtaining a supply of water must be in accord with the idea of the recent law of Congress for building reservoirs for storing a supply which can be obtained from melting snow and the spring rains. There are but few parts of central Dakota which are not traversed by the "dry runs" before spoken of, as well as numerous depressions, which show the location of former lakes and ponds. These can be made to retain a portion of the usual large quantities of water which pass through them in the spring, by means of one or more dams, which are easily and cheaply constructed at suitable points for the purpose designed. Of course the higher the banks at the place where the dam is to be placed the deeper and more pure will be the body of water which is obtained; yet a dam of three to five feet in height can often be used to hold a large though shallow body of water, which will supply wells dug near its margin with clear cold water in unlimited quantities. A resident of this county a year ago threw up a low dam, some three or four feet high, across the outlet of an old lake bed. In this bed he sunk three wells some twenty feet deep and six or eight feet in circumference, which were stoned to the top, and covers placed over them. This spring he had a fine body of water, covering some forty acres and from one and one-half to three feet deep, the deepest portions being over the wells. The pressure of the water on the bottom of one of these wells is over 180 tons, which can only serve to force the water into the surrounding ground. To-day a test auger sunk anywhere in the surrounding earth shows an unlimited supply of water at a depth of about five feet. R. G. NEWTON, Faulk Co., Dak.

Too Much Rain in Illinois.

The entire winter and spring has been extremely dry up to date. We are now (the middle of May) having soaking rains with indications of more to follow. Wheat promises to make a good crop.

Oats has looked very poor, but will probably now make a crop. Good stands of corn are everywhere. Potatoes doing well, with good prospects for all kinds of fruit. Asparagus is an important crop with us. The season has not been very satisfactory, prices being extremely low, and nothing but a strictly first-class article found a profitable market.

E. P. KELLENBERGER, Madison Co., Ill.

A Prickly Friend.

The cactus called prickly pear or Indian fig is as common in Southwestern Texas as the dandelion is in the Northeastern States. It is a leafless evergreen, with fleshy, succulent stems. The stems are jointed, each joint being flat—not unlike a thick pancake—longer than broad, the largest being about a foot in length, and an inch or two less in breadth. On both sides of these flat stems, and along their narrow edges, are clusters of long, sharp spines, and short fine bristles arranged in rows. The bristles break from the plant and cling to the skin or clothing on the slightest touch. The flowers are pretty and fragrant, and the bees make a pleasantly flavored honey from them. The fruit is reddish in color, slightly acid in flavor, very seedy, and not very good to eat. Its shape is between that of a pear and a fig, hence the common names of the plant. The horses pick their way with great care among the cactus beds. They seem to be always on guard when walking about them, and their deftness in avoiding contact with the stems is surprising. On the inner side of the skin of game, such as deer and rabbits, are found numbers of the cactus bristles lying parallel to the skin, having worked their whole length through. After these bristles pass under the skin they become soft and give no further pain or trouble. Quail and other small game take refuge from the gun of the hunter under the broad, spreading stems of the prickly pear, and rarely can it be secured without many a stab from its bristly protector. This prickly armor of the cactus has its use in preventing its soft, fleshy stems from being entirely devoured by the herds of goats, sheep and cattle that feed upon it in winter. Some humane ranchmen burn the prickles off the cactus for their herds; others grind the stems; then the sap softens the prickles so the poor creatures can eat their food with some degree of comfort. It is a painful sight to see cattle feeding on the cactus in its natural state. Their faces are stuck thickly with bristles, and their tongues and mouths twist in the most tortured manner in their efforts to chew their food with the fewest possible wounds. Beef tongue is not to be had in the meat market in the winter season, because it is so full of bristles it is not fit to eat. After all, in this part of the country, where cattle are almost never fed, they could not exist in winter without the prickly pear. The dry, gravelly soil of this section, of which there is a large proportion, furnishes the best conditions for its thrifty growth; its stems store up a vast quantity of mucilaginous pulp in the long summer, and when winter comes and other herbage is scant, it furnishes an unfailing supply of food. The condition of the cattle in the spring does not speak well for the amount of nutriment obtained in this food; they have barely existed. The fleshy stem of the prickly pear is largely composed of water. Travellers often find relief from thirst by chewing the pulpy inside. It also has quite a reputation as a domestic remedy for sores: scraped into a poultice and applied raw, its effects are said to be most beneficial.

This cactus rarely grows to be more than four feet in height, but its broad green stems add interest to the scenery of this beautiful country, especially in winter. The whitish bluffs and ridges where it most delights to grow furnish an effective background for it and the more stately Spanish dagger.

MRS. J. M. MILLIGAN, Kerr Co., Texas.

"Striking Brine" in Kansas.

Kansas last spring experienced one of her most promising seasons. Rains came in abundance throughout the entire State, and the crops are looking excellent indeed. Here in Pawnee county, on the 18th of May, wheat was standing waist-high and so very heavily upon the ground that with much difficulty one could walk through it. This is indeed a beautiful country. From where I write this I can look out twenty miles over the prairie, which resembles a beautiful lawn. Learned is the county seat of Pawnee county. It is a city of five thousand inhabitants. Eight years ago it numbered but four or five hundred. Excitement there is running high over an artesian well of medicinal waters. This well has just been developed at a depth of six hundred feet. It throws a stream of water filling a six-inch pipe sixty feet in the air. The analysis of this water attracts attention of capitalists from all parts of the country:

ANALYSIS OF WATER.	GRAINS PER U. S. GALLON.
Organic matter	.087
Silica	.117
Alumina and iron oxide	.216
Bi-carbonate of lime	127.230
Bi-carbonate of magnesia	25.520
Sulphate of sodium	332.920
Bi-carbonate of sodium	146.939
Chloride of sodium	3,373.611
Boracic acid	(traces)
Total solids	4,006.640
Chlorine (combined)	2,035.800

The chemist's report says: "This is an excellent bathing water. It contains nearly twice the amount of chloride of sodium that the Atlantic does, and also sodium carbonate, sodium sulphates, magnesium carbonate and boracic acid."

A. H. DUFF, Pawnee Co., Kansas.

Opportunities in Montana.

Travelling here and there throughout Montana during the past year I have often wondered why the attractions of climate, soil and mineral wealth were not made known more generally, that the young and unemployed blood of the East, both male and female, and the unemployed capital also, might seek this favored territory for both labor and investment. Wages are high and there is constantly increasing demand for workers, and there is no limit to the extent that capital may be profitably employed. Any young man with a little capital, if he is reasonably conservative and patient, can come to Montana and lay the foundation for great wealth. Of course it would not be wise to put his money into the first "hole in the ground" that was offered, but if he be reasonably intelligent and devotes the first few months exclusively to acquiring information, he may then safely venture to assist some prospector in the development of his claim or claims, thereby securing an interest—which is generally the lion's share. This course cannot safely be pursued until the investor has passed the age of a "tender-foot," but if he will go slow until he acquires knowledge and experience—by investigation and study—his ducats will count him great returns. Not that it is necessary to go into mining at all, for innumerable opportunities exist in every line of business as new developments occur. Any industrious, honest young man or woman can make and save more money and enjoy better health in Montana than, to say the least, would result by the same effort east of that point. So far as social and educational facilities are concerned, any of the Montana cities offer just as favorable opportunities as are enjoyed by towns of like size in "the States;" and Helena very justly boasts of its own "four hundred" and backs it by its reputation for unequalled wealth.

Great as Montana's mining business now is, and vast as it must become and continue to be, it is merely a good first in the race for supremacy between the miners and the cattle kings. Several million cattle, horses and sheep now occupy the "ranges" of this great State, and experience has absolutely demonstrated the superiority of this favored land for successful operations in this line. The choicest blood is now introduced into horses and cattle, and already "Montana bred" is a recommendation for either in any Eastern market.

As far as agriculture is concerned, the heaviest crops of oats, wheat, barley, potatoes, roots, clover and timothy are raised in all of the valleys. The average yields per acre of any of these crops would seem so phenomenal to Eastern readers that it is scarcely worth while to give statistics which show from forty to sixty bushels of wheat to the acre, from seventy-five to one hundred of oats, six hundred to seven hundred bushels of potatoes, and three to four-and-one-half tons of timothy. Yet these are common yields in all the valleys, and there are great areas yet uncultivated.

For those who would like a brief summary, to put in one's hat as it were, of what attractions Montana presents, I have prepared the following: A climate of unsurpassed attractions with never more than two months of what an Eastern man would call winter. Abundance of pure water and timber. More unoccupied fertile land than there is cultivated land in all the New England States combined. Abundance of coal, and limitless amounts of the best building materials like lime, cement, brick-clays, fire-clays, granites, marbles, jaspers, sandstones, etc., etc. Indeed, Montana will some day place upon the market the finest ornamental stones in the country. Mountains literally full of gold, silver, copper, lead, iron and all the metals of art. Vast areas of gravel containing pay gold. Limitless ranges for cattle, horses and sheep. Streams that are filled with trout and grayling, and abundance of game everywhere. Innumerable opportunities for young men and women who are willing to work; with large wages and cost of living less in proportion than the wages. The best and safest field for investment now offered capital in any part of the United States.

EATON B. NORTHROP, Lewis and Clark Co., Montana.

Southern California.

Three years ago I came to California for health, and after spending several months in the State at last decided that San Diego county was the most desirable place. The climate is simply perfect. It is neither hot in summer, nor cold in winter. About forty degrees during the day is pretty low, and ninety degrees is higher than I have ever seen the the thermometer. My health began to improve at once, and while my condition required time as well as climate, I am now strong. I did not come to stay, but only to regain health; yet for the past two years it has been *home* to me. Tomatoes grow the year round with blossoms, ripe and green fruit, every day in the year. A comfortable home may be built for a small sum. It does not require plaster, nor even foundation or studding,—simply boards painted outside, lined with cloth and paper inside, and a good floor and roof. From $50 to $100 per room would build such a dwelling, and many houses are built for less. Grain can be grown at once, chickens started, and the garden prepared. Two acres of alfalfa will soon furnish considerable food for cows, chickens, or horses. Alfalfa furnishes from three to five and even as high as seven cuttings a year, yielding from one to three tons per acre at each cutting. Barley and wheat do well, both for grain and as stock feed. Barley hay is excellent for working horses. It is cut green before the berry is filled and is the best feed for driving horses unless wheat hay is its equal. Oat straw grows too large and hard, and this is not a corn country. There are wild forage plants such as alfileria and burr clover, while in some localities immense fields of wild oats furnish good pasture or hay, if cut. Something can be raised the year round. The necessary buildings will make no great inroad on a small capital. Once settled, a newcomer will be like us all, and could neither be coaxed nor driven from this sunny climate. Gentle breezes by day, cool nights always and not over fifteen or twenty rainy days in any twelve months, will cause one to fear any other climate in the country. I set out peach and apricot trees, and fifteen months afterward picked fine fruit from the same trees. Grapes are easily raised, and finer ones I never tasted. From two to three weeks in the sun changes these grapes into raisins for which the world is a market. Raisins by the ton or carload are the product of comparatively small ranches. A peach, or apricot orchard, or a vineyard is not long in coming to productiveness. Oranges, lemons and olives are much longer coming into bearing, and improve until they are quite old trees. I have eaten olives from one orchard said to have been planted by the Padres from Spain over one hundred years ago. Do not misunderstand me, and think any of these fruits grow wild; or that no labor is required to grow them. But the kind of thrift which exists in New England, and the hard work the Western farmer is familiar with, will accomplish wonders, if directed intelligently here. Some money is needed. Of course, no one can buy land and improve it without some money. Few people who have lived here one year ever go away again. They cease to see any pleasure in working hard less than half the year and in spending the earnings in trying to keep warm the rest of the time.

H. F. NORCROSS, San Diego Co., Cal.

Every Farmer Should Read It.—I cannot find language to sufficiently express my many thanks for the great good we have derived from reading the, to me, indispensable AMERICAN AGRICULTURIST. I must say to all my brother farmers, that no other paper gives more valuable information. Would that every farmer in the land would read and be profited by it.

C. W. SMITH, Oldham Co., Ky.

OUR BASKET.

Poisoned Apples.—The Codlin moth, so long the great obstacle to the grower of apples, is now readily kept in subjection. The poison must be applied soon after the blossoms fall. With all care some of the apples will escape the poison, and the worm enter the young fruit. All fallen apples should be gathered up, and if soon after the poisoning, should not be fed to the pigs. The safest way is to deposit them in the manure pile or to dig a hole and bury them.

Delights of Florida.—O. P. Rooks, Fruitland Park, Fla., writes us: "It is now midsummer, the mercury ranging between 70 and 90 degrees, but our nights are delightfully cool. My nine-year-old olive trees are setting full of fruit. Have several hundred pineapples grown to half their normal size, Peen-to and Bidwell's early peaches ripening; strawberries in abundance; a few King Tardive, Sanford Mediterranean oranges and Pomelos still hang on the trees. Cattley guavas and Japan persimmons promise wonderful yields. This season of midsummer growth is delightful.

"Evaporated" Fruit.—There is a great difference between the fruit dried in the old way, exposed to the attacks of insects and the depredations of farm animals, and the so-called "evaporated" fruit dried by artificial heat. The first of these "evaporators" were cumbrous and costly affairs, but now several "fruit dryers" or "evaporators" are made, suited to the family requirements and within the reach of those of moderate means. Consult advertisements and send for circulars. It is a matter worthy of intelligent study.

Hay for Home Use and for Market.—If to be used for the farm, do not allow it to get too ripe; if to be sold for baling, the purchasers do not mind the hard stems, they think that there is more "substance" in it. So there would be in shingles, and in any kind of wood. The beginning of flowering is the proper time to begin cutting clover, as well as the grasses. Timothy becomes hard and woody much more rapidly than orchard-grass. It makes better hay to sell, but not so good to feed out.

Poisons.—The general prevalence of the Colorado potato beetle, or "potato bug," as it is often called, has made the use of Paris green and other poison very general, and there is danger that their dangerous character may be lost sight of. Let the farmer superintend the use of poison himself and keep the supply, as well as the buckets, syringes and everything used in their application in a closet, locked up, so that no accident may occur to farm animals, and no evil-minded person may get at them for intentional poisoning.

"Where Can Nitrate of Soda be Obtained?"—A subscriber from North Carolina asks the above question. Nitrate of soda is so seldom used in this country that it is difficult to get it in small quantities at reasonable rates. It is imported for chemical purposes, and the large dealers do not care to sell less than a carload. Ask your nearest fertilizer dealer. Nitrate of soda is the cheapest and best source of nitrogen, and the dealers will keep it as soon as there is a demand for it—but not until then.

Boulders on the Prize Acre.—Inquiries are coming in from various quarters in relation to large boulders on the acre of land on which the trial for the prize is to be made. A farmer writes: "The boulders I speak of occupy 12 to 40 square feet, and there are a dozen of them on the acre selected." It will be impossible for us to allow deduction to be made in the cases named, as an endless amount of discussion, guesswork and trouble would follow. If it be impossible to secure an acre without these objectionable boulders it may pay to remove them, or to make the soil enough richer to compensate for any loss in area which they may occasion.

The Right Time for Pruning.—The largest branch starts from a bud, which a slight movement of the finger would have broken off. By going over young trees and rubbing off buds that appear where branches are not needed, there will be very little pruning to be done when the trees come into bearing.

Double Elder.—"Florist," Rochester, N. Y.: The double flowered Elder bush (*Sambucus Canadensis plena*) is not a myth, as you appear to think, for we had it in cultivation for a number of years, but the plants were accidentally destroyed. We received our plants from the late Dr. Charles Siedhof of Hoboken, who imported it from Germany about thirty years ago. It is possible that stray plants may be found in some of the old gardens of Hoboken or the neighborhood. The flowers are pure white and very double, otherwise the same as the common elder. Double lily of the valley are to be found in gardens in the suburbs of New York, if not elsewhere. This double variety is a much more vigorous grower than the single or original form.

One Book to a Crop.—Henry Campbell has decided to compete for a prize on more than one crop, and asks if he cannot keep a record of each crop in the same book. This is not admissible. A separate book is required for each crop that is raised.

Experience in Spraying Apple Trees.—In 1887 one of our orchards set a good crop of fruit, but it dropped badly until only one-fourth of the crop remained, and of this nine-tenths was wormy and unfit for use. In 1888 all of our apple trees set a heavy crop. We bought a Rumsey pump and Nixon nozzle, sprayed the trees just after the bloom fell, using one pound of London purple to one hundred and twenty gallons of water, and as a result a wormy apple was hard to find. One pound of London purple to one hundred and fifty gallons of water is strong enough. Make the spray as fine as possible; the more like dew the better. Do the work yourself, and be sure not to trust it to incompetent hands. Throw the streams strong but gently. We have two orchards of forty acres each. The first one I sprayed I used three times the water I did upon the second, and the last sprayed has done the best. This year I spray peach as well as apple trees, using one pound of London purple to one hundred and fifty gallons of water. The orchards are free from all kinds of worms that work upon the leaves. The purple is not poisonous to the hands; mine were constantly wet with it, and so was the team. A friend has used it for three years upon late cabbage with good results and no ill effects.

C. B. ROCKWELL, Hancock Co., Ill.

What Seed to Use.—Some of the competitors for crop prizes are still in doubt whether the use of some variety of seed may not debar them from securing the AMERICAN AGRICULTURIST'S premiums. These premiums are for the best crop, from any kind of seed. A competitor is only debarred from competition for a special, outside prize from some seedsman, by failing to use that seedsman's seed.

"Futures" of California.—In answer to an inquiry about the value of Maguey, W. H. W. Campbell, San Bernardino Co., Cal., writes us: What is thought of the Maguey plant, or "Spanish Dagger," in South California, is this: No doubt of the excellence and toughness of its fiber, but the labor of preparing it is double that of hemp. The plant will grow luxuriantly, but the price of labor places competition with hemp among the possible "futures," like that of the ramie plant, which has many more advantages. These are not the sole "futures" of this region which are held in abeyance by existing prejudices and practices of trade, or by the cheap labor of heathen countries. The cactus of our deserts has a superb fiber for paper. I am informed that it is taken to England for the production of Bank-of-England note paper, but it is not a profitable crop here. "The best opium I ever saw was grown hereabouts," said an old Californian to me the other day, "but it cost ten dollars a pound to produce, against a market value of seven dollars;" relegating it also to the time of "futures" if anything—which the Lord forbid.

Rye in the Garden.—If a crop is removed and another garden crop is not required, sow the land with rye; if cows are kept,—the waste of a moderate garden will go far toward keeping one cow, and the rye will form acceptable food in both fall and spring. Peas may be used for the same purpose, but they end with the season. If preferred, the land may be sowed to buckwheat, to be turned under as a green manure.

A Neglected Crop.—The Rutabaga or Swede Turnip, if thought of or grown by farmers at all, has usually been considered only as a crop for cattle feeding. It may, however, be made a profitable market crop, especially near cities having a large German population. Rutabagas are easily grown and are immensely productive. Sow in drills two feet apart, about the middle of June, and thin to about eight inches. Keep the ground clean and mellow and they will grow until freezing weather. The purple yellow-top is one of the best for the table, and if a good market cannot be found the stock will eat the crop with a relish.

Maltese Asses.—E. J. Way, Ripley Co., Mo., proposes to engage in raising mules, and desires our advice as to the merits of Maltese jacks. You cannot start with better stock than a Maltese jack. We would recommend you to inspect some of the establishments in Kentucky and Tennessee where mules are largely bred; if you do not find a young ass to suit your purpose it may be necessary to advertise for one. Many English dealers in horses visit Malta annually to buy asses for export. The cost will probably be from sixty to one hundred pounds sterling for a choice young ass; a yearling proportionately less. Here the scarcity of these imported animals and their immediate descendants render them comparatively costly, but less so than to import.

Peas.—In hot weather peas usually mildew, and are a disappointing crop. If disposed to try a late crop, the early varieties, such as Alpha, are most likely to succeed and give a satisfactory crop.

Full of Enthusiasm.—A subscriber in Washington Territory writes us under date of May 4: I planted the "prize acre" of potatoes on the 29th and 30th of April. The land was in fine condition and the weather warm and sunshiny. Every day since it has rained copiously. Should they come up well *I shall grow lots of potatoes on that acre!*

Cultivating the Crops.—Much of the success in growing root crops depends upon keeping them clear of weeds. Cultivate often; also the later corn. If there are no weeds a light soil is an excellent mulch in a dry time.

Crop Prospects in Illinois.—W. H. Hughes, Clay Co., Ill., writes us under date of April 8th: The weather is very fine, and double the quantity of oats has been sown than ever were sown before. Prospects for fruit are fine, and the wheat looks good. Have had no winter here.

Forage Crops.—The misfortune of a short hay crop may be neutralized by a timely sowing of several crops that may be fed out fresh, or converted into hay. Millet (German) or Hungarian grass may be sown for a crop of hay, especially on well-fertilized land. Sow the fall turnips, Yellow Stone and Aberdeen, at once, and an abundance of white turnips, such as Red-top Strap-Leaf, next month. Fodder corn may still be sown.

Just One Acre.—Competitors for the AMERICAN AGRICULTURIST prizes should bear in mind that the prize acre need not be square, necessarily. The surveyor can lay it out for convenience with three or more corners; but it positively must not contain more than one acre.

Budding, in most Northern localities, begins this month. No stated time can be set, as the proper season begins much earlier at the South than at the North, and the time will vary in different years upon the same farm. One must use judgment. The stock must be in a proper condition; that is, when the bark can be readily separated from the wood, or as the professional budders say, "the bark will run." Then the buds must be in

the proper condition of maturity. Upon a twig the upper buds may be too immature, while the lowermost are poorly developed, but between these will be found several buds, well-matured and fit for use. Plums are usually the first to be budded, the last of this month or the first of next; then pears or pear stocks; these are followed by apples. Peaches are budded in the first year of the growth of the stock from the stone, and usually in September. In ten days or two weeks after the buds are inserted they should be examined, and if the bast used for tying is so tight as to cut the bark of the stock, it may be loosened, but usually the ties may be cut away altogether in three weeks after the buds are inserted.

Care of Greenhouse and Window Plants in July.—Whether the plants are placed out of doors or kept in the house for the summer, they should not be neglected. In dry weather the soil in the pots soon dries out, and the roots become greatly injured. Give all needed watering, and if the soil has become baked, set the pots in a tub of water until they are thoroughly soaked through. Look out for insects, and if the plants are disposed to grow out of shape, check this by pinching or pruning. Make all needed repairs on greenhouse and heating apparatus early, and lay in potting soils and other needed supplies while there is abundant time.

Iris Kæmpferi from Seed.—This beautiful plant is readily propagated from seed. Few persons are aware of the great variety of colors and beautiful markings there are in these flowers. Fully ninety per cent of the seedlings will prove worthy of keeping. The plants will bloom the second year, if proper attention and good cultivation are given during the first season. Be sure and get good seed. It should be sown in rows two feet apart and the plants thinned out to one inch in the rows. In October transplant to their permanent quarters. They will do well in any soil, the richer the better, but give them all the sunlight possible.

Raising Tomatoes in Dakota.—R. G. Newton, Faulk Co., Dak., writes us that he finds plants grown from seed and dropped in the hills in the open ground, to give ripe fruit almost, if not quite as early, and at a small part of the expense of transplanted plants. He plants in rows, four feet apart, and two feet apart in the rows. The Alpha is his favorite variety.

Remedy for Cut Worms.—Last summer when the cut worm was so destructive, attacking and destroying often in a night the most vigorous and thrifty plants, I had tried everything I ever heard of and was almost in despair when a friend advised me to remove the soil an inch or more from the surface and wrap the stem of the plant with a piece of paper. I gathered up a lot of old papers, among which I found one thoroughly saturated with coal oil. I hesitated at first about using it, but concluded as coal oil was a panacea for man and beast, I would venture it upon some of my most promising tomato plants; which I did with the most satisfactory result, the paper upon the others proving a failure, while that with the coal oil accomplished its object, driving off the pest effectually. I applied the paper dipped in coal oil to the other plants, and found it equally successful.

SENIE COLE, Jefferson Co., Ky.

Mr. Charles E. Whitman, President of the Whitman Agricultural Co., of St. Louis, Mo., paid us a friendly visit on his way to the Paris Exposition, in the interests of his company, whose large and instructive exhibit is attracting a great deal of attention from visitors from all parts of the world. Of course it is a foregone conclusion that the Whitman machines will be awarded the highest prizes in the power of the judges to confer, as has been the case wherever they have been exhibited.

Illinois Asparagus.—E. P. Kellenberger, Madison Co., Ill., sends us some bunches of as deliciously flavored asparagus as we have ever tasted. In an accompanying note he writes: "We are planting our asparagus four feet apart each way, at a depth of not less than six inches from the crown of the plant to the surface of the soil. The trenches are filled in gradually at different cultivations, two inches at a time until the ground is level. We use one-year-old plants and cut sparingly the second year, with three-year-old plants we cut the season through. We use no manure or fertilizers of any kind. The land is a sandy loam subject to overflow, and will produce from seventy-five to one hundred bushels of corn to the acre year in and year out. It is practically inexhaustible."

Useful Old Horses.—Albert Bryan, Floyd Co., Iowa, writes us that in looking over a file of the AMERICAN AGRICULTURIST he saw a statement that three old horses, aged respectively twenty-five, twenty-six and twenty-eight years, "worked regularly." I cannot quite come up to this, but on this place is an Indian pony thirty-eight years old, that we husked corn with last year, and it requires a good horse to catch this pony when in the pasture. There are numberless horses in this county above twenty-two and twenty-three years of age who do all the regular work.

Alfalfa in Nebraska.—Peter Meyer, Gage Co., Neb., writes us that it has often been stated that alfalfa is not hardy in this latitude. "I sowed a field of it a year ago, and it had no protection during the winter, and although the horses have been rolling there, it has come up strong and green. This makes me conclude that alfalfa is pretty tough."

German Potatoes.—A subscriber from Bismarck, Dakota, desires to know about the German potato, why it commands such high prices and why no one raises it in this country. North Dakota, he writes, raises potatoes of the finest quality in the world, and if they will grow in this country, we shall improve their size and quality. There are hundreds of different varieties of potatoes grown in Germany, just as here. The kind generally imported is small, very fine grained and rather "soggy." It is used principally for salads. If it could be improved and made to grow larger and more mealy, it would be useless for the purpose for which it is imported. We have imported from Germany more than one hundred different varieties, and in the whole lot, we have not found one that would in any way compare with our best American varieties, as grown here at least. The old Peachblow is still grown to some extent, although it has long ceased to be the leading variety in the market.

How to Keep Meat in Hot Weather.—F. B. Livezey, Howard Co., Md., preserves meat by putting it in large preserving jars, screws on the covers and places the jars in a spring. Not having ice, he writes us, fresh meat could only be kept a couple of days in the cellar, but on trying this process he found that meat, poultry, etc., kept well for a week.

What Ailed the Pigs.—J. D. Hunt, Hillsdale Co., Mich., writes us that one of his pigs died at seven weeks old, and all the others of the same litter acted very peculiarly. The sow was fed plentifully of corn and milk before and three weeks after farrowing, when he was persuaded by a neighbor to shut off the corn and give other feed. An autopsy of the pig showed an unhealthy liver and the heart greatly enlarged and soft. Another sow was fed very little corn before farrowing and none after. Her pigs are lively and healthy. The case conveys a significant lesson on injudicious feeding. The dead pig was a victim to fatty degeneration of the heart, caused by too much corn. If the sow had been fed on bran, cooked oil-meal and other nitrogenous food, with some carrots or other roots, it would have been much better for her and the pigs. The best thing now is to turn both sows and all the pigs to pasture and give them moderate rations of wheat or rye bran, but no corn whatever until fall.

New York State Fair.—The next annual fair of the New York State Agricultural Society is to be held in Albany, September 12 to 19. It should be borne in mind that entries close Monday, August 12.

Planting Winter Cabbage.—It is not necessary to wait for a rainy day to do this work, and from long experience I have come to the conclusion that a wet day is the worst for this important business, because no man can do good work in the rain; he is in too much of a hurry to get through with discomfort to be thorough. We select a fair day, not too hot, take up our plants when the earth around them is dry, so that it will not injure the delicate roots in falling off, then wet the whole, in a basket to prevent drying up, after which fill the holes, where they are to be set, with water and puddle them in; pack the mud closely around the plants, then cover with light, dry earth, and not one in one hundred will fail to grow.

C. L. ALLEN, New York.

The Sower, not the Seed, to Blame.—A most serious source of loss each year to gardeners, both amateur and commercial, if we may rely on their own statements, is poor seed. I have probably not been more fortunate than others in this respect in the past, but this year I determined at the start to reduce the loss from this cause to the lowest possible point. To accomplish this I gave personal attention to seeing that every seed put in the ground was covered with fine soil, and that the covering was well compacted along the row after planting. The seed also was planted as soon as the ground was prepared, thus giving it at the start the benefit of whatever moist soil was brought up from below the surface. As the season advanced and the ground became dryer, all seeds were soaked in tepid water for twenty-four hours, and then covered with extra depth of soil. March and April were exceptionally dry months, and the signs of drought are everywhere visible, but as yet I have had no reason to berate the seedsmen for "poor seed."

JAMES K. REEVE, Ohio.

A New Potato Chart.—We have received from Edward A. Pharo, an ingeniously devised chart which shows at a glance the origin, formation and shape, relative size, and time of maturity of the leading varieties of potatoes. It is arranged into four groups, namely: the Early Rose Group, descended from the Rough Purple Chili; the Peachblow Group, descended from the Merino; the Excelsior Group, descended from imported seed; and the Miscellaneous Group. The collection of the material needed for the preparation of this chart, Mr. Pharo informs us, has required many years of labor and investigation.

Fruit Crop Reports.—The Missouri State Horticultural Society, L. A. Goodman Secretary, has an admirable system of keeping posted on the condition of the fruit crop of the State. Printed blanks are placed in proper hands throughout the State to be filled up and returned to the Secretary at stated intervals. The per cent is based upon 100 as a full crop, and the reports are made to embrace all facts bearing upon the condition and prospects of all kinds of market fruits.

Winter Oats in Georgia—Cotton Seed.—A. C. Jackson, Monroe Co., Ga., writes: "Perhaps half the oats sown here are sown in the fall. When not winter-killed they make a good yield. I have frequently grown 60 to 75 bushels per acre without manure, and parties near here claim to have grown 125 bushels per acre." This refers to winter oats. "Oats sown in January and February," Mr. Jackson continues "are generally cut off by drought, and the yield is very small. I manure my January oats with an equal mixture of cotton seed meal and acid phosphate, applying about 200 pounds per acre. I get the meal in exchange for cotton seed, at the rate of one ton of meal for two tons of seed. I feed the meal sparingly to my milch cows, and also feed them the whole seed, cooked. The meal (cake) is a dangerous food, while the whole seed is perfectly harmless to cattle." This is curious. Many farmers with us think cotton seed meal a dangerous food, and they think the oil left in the cake or meal is constipating, and this causes the trouble; and yet, according to Mr. Jackson, the cooked seed, containing *all the oil*, is harmless. From this it would seem that if the cake or meal is dangerous it is not owing to the oil, but rather, probably, to some indigestible matter in the cake. In England, the late Dr. Voecker told us some years ago that cotton seed cake could be fed with safety to cattle and sheep, *letting them have all they could eat.* This matter needs investigation. The English farmers feed, as we suppose, cotton seed *cake*, merely crushed, while here we feed *meal* ground fine, and if there is anything in it that the cattle do not like they cannot reject it as they could in the crushed cake.

Orchard Grass vs. Timothy.—A. N. H., Mich., asks, "Do you consider orchard grass preferable to timothy for hay and pasture?" If you are growing hay for market nothing will be more profitable than timothy; if for your own use and especially for hay and pasture combined, we are confident that orchard grass can often be grown to great advantage.

AMERICAN AGRICULTURIST
FOUNDED IN 1842

JULY, 1889.

The Great Crop of the Season.

Weeds are the great crop of the season. Every farmer should know all the weeds on his farm, and their manner of growth, whether they are annual, or last more than one year. He harvests his grain before it is ripe, knowing that the process of maturity will go on, but he often does not think that many weeds if cut soon after they have flowered, will ripen their seeds as well as if high on the ground, and these weeds if thrown on the manure heap, or into the pig-sty, will afford an abundant supply of weeds to continue the trouble. Keep a sharp eye for any new or strange weed that appears on the farm. If need be, extra exertions may be made to prevent it from spreading. The safest way to dispose of weeds is to burn them. Make a small fire of any wood, throw on the weeds, a few at a time. It is astonishing what an amount of green stuff may be burned in this way, and quite a quantity of ashes will be left which should be spread. They will benefit any crop.

Prepare for the Census Taker.

The eleventh general census of the United States will be taken next year, and the facts and statistics collected will possess peculiar interest for the reason that they show the condition of the country at the beginning of the second century of our constitutional existence. It is specially important that the returns in relation to farm products and live stock shall be full and correct, agriculture being the leading industry of the country. The enumerator will visit each house during the month of June, 1890, and every farmer should be prepared to give accurate figures showing the desired facts. The census year began with June 1st, 1889, and ends May 31st, 1890. If all farmers throughout the country will keep accounts of the products of their farms for that year, it will enable them to give correct figures instead of guess work. We have known of a few farmers who withheld a part of the information sought, and belittled their returns, under the mistaken idea that somehow they would be used against them in assessment for taxes. This is wholly groundless and absurd. There is no connection between the work of the census taker and that of the assessor.

Hereditary Diseases in the Horse.

The Council of the Royal College of Veterinary Surgeons of England was desired by the Royal Agricultural Society to give a list of the hereditary diseases in the horse, as a guide to be used by it and other societies in rejecting in their shows for prizes all such as were thus diseased. Circular letters were then sent out to 2,500 members of the college for reports on this subject. The answers were: roaring, whistling, sidebone, ringbone, navicular disease, curb, bone spavin, bog spavin, grease, shivering and cataract. The council also decided that under certain circumstances all horses shall be rejected for breeding purposes that are affected with splint, stringhalt, contracted feet, weak feet, bursal enlargements, such as thorough-pins and wind-galls.

We publish this with the hope that the officers of all American agricultural societies may see it and decide not to admit any stallions to their exhibitions affected as above stated; and we wish laws could be passed by every State in the Union prohibiting such breeding in the country. We should then have few save sound, serviceable, enduring horses, and gain millions of dollars by this improvement in their production. Go to any considerable horse mart and look over the animals critically on sale there, and one will be astonished to find how few are perfectly sound and reliable for enduring service.

Farm Life and Health.

Farmers are the longest-lived of all the laboring classes, and if they lived up to their privileges, their longevity would be greatly increased. There is no place like a farm for the children. Here the boys and girls have plenty of chance to play out of doors, to dig in the dirt and bask in the sun, and to live close to Nature during all the period of body-building. In this way the foundations of good health are laid. Then, too, the farmer's work keeps him most of the time out of doors, and under favorable hygienic conditions. There is a variety in his employment which tends to harmonious physical development. He has not, like the shoemaker or the blacksmith, to exercise one set or a few sets of muscles constantly, while the others shrink up from disuse. Farm life, too, calls for constant exercise of the mind. The farmer who puts the most brain into his work is the most successful. Then the leisure of certain seasons of the year, and especially of the long winter evenings, furnishes a good opportunity for reading, study, intelligent conversation, and other means of mental culture. Farming tends to cultivate independence of character. The farmer is his own master more largely than most other classes of men. He has not to cater to the whims of the public, and it is susceptible of demonstration that these things favor health and longevity.

But there is a reverse to this picture. At certain seasons of the year—notably in haying and harvest time—the farmer is apt to overwork himself. He rises early and goes to bed late. More than this, far too many farmers suffer at all seasons of the year from serious unsanitary conditions in and about their houses and outbuildings, such as darkened parlors, damp and foul cellars, unventilated rooms, lack of proper drainage and disposal of waste, leading oftentimes to a contaminated water supply. These things diminish vitality, and result in rheumatism, consumption and typhoid fever. Worst of all, the farmer's wife suffers from constant overwork, drudgery, and mental stagnation. She has little recreation, little outdoor exercise, little rest from the eternal treadmill of household cares. The result is, that many a fresh and rosy-cheeked girl who marries a farmer soon grows thin and pale, and worn and weary, breaks down in health while still young, and too often dies prematurely.

How can this be remedied? First, by better farming in general; better houses, cellars and outbuildings, better farms and farmyards, better stock and cattle, better conveniences, and more satisfaction in life. Secondly, by better care of health; by realizing that health is the result of obedience to natural law, and disease of its violation; by studying to know that law, to teach and to keep it; and by laboring to make the most and the best of life.

Show-Yard Condition of Horses.

Exhibitors of horses at agricultural society shows complain that in order to obtain any chance for a prize, they are obliged to make both stallions and mares so fat as to render them almost worthless for good breeding that season, and, sometimes, during the remainder of their lives. Horses for general use in fair working condition, weighing from 900 to 1,200 pounds, are increased in weight, by this pernicious fattening, up to 1,000 to 1,400 pounds; while the large draught horse of 1,500 to 1,700 pounds is made to weigh from 1,800 to 2,000 pounds.

The Earl of Ellesmere, an extensive breeder of horses in England, refuses to exhibit hereafter. He says "the risk involved in bringing stallions and mares into the condition which is necessary to give them a chance of prize money, have been found to be so great, that I will no longer tolerate the ruining them."

Stallions taken round in our country to the farmers for service are often made hog-fat. In such condition they are greatly impaired for breeding purposes, as it has been proved over and over again that their progeny grow up weakly, are liable to become unsound, and make very indifferent horses; in fact, occasionally quite worthless. When breeding, keep horses in fair condition only; work them gently from day to day, or exercise at a walk or gentle trot of several miles. Then, if sound and healthy, we may expect valuable offspring from them, and such as is well worth rearing.

Camping Out.

This is a kind of recreation that our farmers practice too little, probably because they do not know the fun there is in it. If a place by the sea or lake is within reach, that is to be preferred for the camp, but any pleasant spot on hill, mountain or plain, that affords the three essentials of a camp, wood, water and grass, will do, provided the greater requisite of all is taken along,—an abundant supply of good nature. Leave the grumbler at home. Take along the covered wagon for the old folks to sleep in, and if there is no tent take along a barn sheet or other canvas, to extemporize a shelter for the younger members. Having determined how long the camp is to last, provide cooked and uncooked provisions. Take as little table ware, and that of tin, as will go around. Pack sugar and salt so that they will not mix as they are apt to do if in papers, and don't forget the matches and a water pail. Those who enter into camping with the right spirit will enjoy the overcoming of obstacles, and making the best of everything, and will be glad to go out again next year.

FARMING IN FOREIGN LANDS.

The North British Agriculturist tells of a Leicester ewe, belonging to Mr. Webster Muir, of Auchincrieve, Banffshire, which has just given birth to three lambs. This ewe has now given birth to twenty-one lambs in all, having had in successive years—two, three, three, four, four, two and three. She is still fresh and seems good for some seasons to come.

Trotting action seems to be growing in favor in the British Islands. A leading newspaper there states that Mr. James Johnstone, of Lockburn, Scotland, has refused an offer of $5,000 for his Orloff trotting stallion, Caledonia. If the showy but not speedy Orloffs can command such prices, it would seem as if there was an opening for some of the American trotting stallions.

Telegraph poles are preserved in Norway by making an auger hole about two feet from the ground, in which four or five ounces of sulphate of copper in coarse crystals are placed and plugged in. The chemical is gradually absorbed by the wood until its whole outer surface turns a greenish hue. The sulphate requires an occasional renewal and is said to be a perfect preservative.

A bill is now pending in Parliament for establishing a Board of Agriculture for Great Britain. It is to be made up of the Lord President of the council, the principal Secretaries of State and some other members of the cabinet, with a president to be appointed by the Queen. There are to be transferred to the Board the powers and duties of other departments of the government relating to agriculture and forestry. The president is to receive a salary of $10,000 a year.

Reports from various parts of the British Islands indicate heavy decline in rents. It is stated that a farm of 1,100 acres on one of the principal estates in West Norfolk, which has hitherto been let for $8,500 per annum, has recently been re-let at a reduction of $5,000 per annum. The crofters' commission have made a reduction of thirty-six per cent in the rent of some of the crofters in the island of Skye, and about seventy-six per cent of arrears has been cancelled.

Persian opium threatens before long to enter into competition with the Indian and China drug, although the crop of 1887 was one of the smallest on record for many years past, but owing to a brisk demand in the European and China markets, prices increased considerably. The adulteration of Persian opium formerly extensively practiced, has now greatly decreased; there is, however, another defect, *viz.*, the lack of skill in manipulation which interferes with its ready sale.

According to an official report on the agriculture of Colombia, South America, there are no cart horses in that country, the heavy work being done by oxen. The ordinary riding horses are small, seldom over fourteen hands, but very strong and enduring. They are considered to be comparatively valueless unless they possess the "pass," or amble, which is the pace universal in Colombia. The few English and American horses introduced for breeding purposes are used mostly for producing carriage horses on the plain. A good saddle horse costs in Bogota from $150 to $300.

The farmers in the vicinity of Barrow-in-Furness, England, have learned a lesson which is of general application. "When that place rose from a fishing village to a town," says a Whitehaven paper, "the seagulls were harassed until they decamped. Then followed a pest of grubs and insects in the ground, which the gulls, following in the wake of each plow, had previously destroyed. The farmers then held meetings and subscribed funds for the protection of the birds; huts were erected near their breeding grounds and watchers were employed, until in a short time the gulls were as numerous as ever, and the pests of the farm were once more exterminated by them."

Coffee growing in the Nilghiri Hills, Northern India, seems destined to be overtaken by the drawbacks which have attended it elsewhere. It would seem that a fatality everywhere attends this special branch of cultivation. Disaster commenced with the failure in Ceylon seven years ago, which ruined so many planters and forced those who had a little capital left to cultivate Liberian coffee in Johore, in the Malay peninsula, or take to tea-planting in its room. After that the *Hemeleia vastatrix* fell upon the coffee plantations of Java, and in a minor degree upon those of Brazil. The Nilghiri Hills have hitherto held out, but the *Journal of Indian Agriculture* learns that the dreaded leaf disease has attacked the plantation there, and is each year getting worse.

Surgeon-General John Shortt, F. L. S., gives some interesting particulars in his recently published "Note" on the cocoanut palm; the tree, which is indigenous to India, also grows throughout the South Sea Islands and in Brazil. In South America it covers an area of nearly a million of acres, while in British India and Ceylon about half that area. The value of the export trade of Ceylon is £800,000, and a single tree in India is valued at about a rupee a year, omitting the profit from the fibre and from the green and dry fronds. The average number of cocoanuts produced is about one hundred, taking bearing and non-bearing trees together. In ten years the trade of the Madras Presidency in cocoanut produce amounted to no less than 816 lakhs of rupees, including nuts, kernels, oil and coir fibre.

The English courts of law have set their faces sternly against the practice of sawing off the horns from cattle. In a recent case which had been appealed to the court of Queen's bench, the Lord Chief Justice, in rendering his decision, said the details of the evidence given in the case were utterly disgusting and showed that the operation of dehorning was detestably brutal. It was stated that it was a most cruel practice, causing fearful pain, and absolutely unnecessary, and this not by sentimentalists, but by men of the world dealing with scientific matters in a scientific manner. He was of the opinion that the operation was not a necessary one, and that therefore the case should be remitted back to the magistrates to deal with. Mr. Justice Hawkins concurred.

The government of Java has always carried on the cultivation of cinchona on the system of free labor, in the hope of its spreading through the whole Indian Archipelago. There are varieties of the plant, but the most valuable is known as *Ledgeriana*, so named after a Mr. Ledger, who procured the seed in Bolivia and first gave it to the Dutch government, but shortly after he was assassinated, and carried to his grave the secret of the origin of the trees which bore his name. The cinchona tree requires a mean temperature of 117° centigrade, and thrives best at a height of 4,000 to 6,000 feet above the level of the sea. The tree is propagated by seeds or by grafts, and there are on an average about 3,000,000 trees in the government plantations. Great attention is paid to the cultivation of the *Ledgeriana*, which often contains from ten to thirteen per cent of quinine.

Matters of Business.

The Single Apron Binder.—The single apron machine of Walter A. Wood, Hoosick Falls, N. Y., has attained great popularity. It is drawn by two horses, the canvas runs easily and does the best of work economically in all crops.

A Salary with expenses paid will come handy to any one who is now out of employment, especially where no previous experience is required to get the position. If you want a position, see advertisement on Page 370. "A Chance to Make Money.

Look Out—For the advertisement of the Appleton Manufacturing Company, 19 and 21 South Canal street, Chicago, which will appear in our August number, of several new machines, which will be of interest to farmers, and of the latest improvements in their celebrated grinding mills, horse powers, feed cutters, etc.

A Rapid Churn.—For a double-geared rapid working churn which brings the butter in a few minutes, the little Cyclone churn is a model. It works without friction, so easily that a child can operate it; the paddles are arranged to throw the cream toward the center, and a thermometer is attached to each churn. It is manufactured by the Steel Pulley and Machine Works, Indianapolis, Ind.

Lightning-Proof Roofs.—The lightning-rod man, in his wanderings up and down the earth, seeking whom he may take in, has encountered an effective obstacle. It is found that an iron roof, of the sort furnished by the Garry Iron Roofing Company, of Cleveland, Ohio, is a perfect protection against lightning. In addition to this advantage, their roofs are fire-proof, and so durable as to last a life-time. In the end sheet metal roofs are much the cheapest.

Rustic Garden Furniture.—Among the various styles of ornaments for the garden and lawn that have from time to time been introduced, nothing has, as yet, been able to supersede tastefully-constructed rustic work. There is an endless variety of designs in chairs, settees, summer houses, arbors, fences, etc., manufactured by the Rustic Manufacturing and Construction Co., New York, and those who desire to embellish their grounds with such work are referred to the advertisement of this firm in this number.

Of Interest to Poultry Raisers.—E. S. Fitch, Bay City, Mich., has received from L. A. Keene, of Van Buren, Ill., the following testimony: "I consider the granulated bone and bone meal I got of you superior to any in the market for use in the poultry yard. I placed my young turkeys on a full feed of your meal on the start, and have not lost a bird. The bone meal generally sold for poultry is worthless, as it is ground from old or steamed bones."

Metallic Shingles.—The National Sheet Metal Roofing Co., 510 to 520 East 20th street, New York, manufacture sheet metal shingles of various patterns, all of which possess qualities which commend them highly to everyone. They are light, durable, comparatively fire proof, absolute protection against lightning, and elegant in form, for either the roof or sides of a house. The company's price-list, with valuable information to builders or those whose roofs need re-covering, can be had by addressing the company as above.

The Ideal Wind-Mill.—Of the many wind-mills in market, the Ideal, made by the Stover Manufacturing Company, Freeport, Ill., possesses many valuable peculiarities. It will run in a very light wind or a gale; is automatic in its regulating movements, and when thrown out of gear, it remains absolutely motionless. It is well and strongly built, of the best materials, and always gives satisfaction. The Ideal Feed-cutter, made by the same company, is a perfect implement for cutting feed and filling silos.

Improved Wire Fence.—The "Duncan System" of fencing is designed for farms, ranges, sheep corrals, breeding pastures and railroads; and such fences can be built as cheaply as those of barb wire. High close wire fences, to take the place of high board fences for breeding enclosures, can be built for three-fifths the price of the latter, and are much better for the purpose. One of the prominent features of this style of fencing is great elasticity, making the resistance to shocks exceedingly powerful. It is made by the Wire Fence Improvement Co., 325 Dearborn street, Chicago.

Reliable Fertilizers.—Out of sixty-four different samples of fertilizers analyzed by Prof. Genth of the University of Pennsylvania, several were reported as falling short in actual value of the market price. The exceptions included the fertilizers made by C. H. Dempwolf & Co., York, Penn. The actual commercial value of all their fertilizers was reported to be from five to seven dollars more than the selling price. Such fertilizers are practically cheaper than low-priced ones which contain less manurial value.

A Decision Sustained.—The award of the judges in the butter test at the International fair, Buffalo, N. Y., last fall, has been confirmed by the board of managers. The decision referred to was the unanimous vote of the board of judges awarding the first prize to Benola Fletcher, H. H. B., 6891, and the second to Netherland Peeress, H H. B., 2840. Both of these cows are from the Lakeside herd of Smiths, Powell & Lamb, Syracuse, N. Y. This leaves the record of the herd unbroken as the winners of every such butter prize which has ever been awarded in the State of New York.

Wind-Mills.—On all farms where the water supply must be raised by pumping, the wind-mill has come to be regarded as an almost indispensable requisite. The only question for each farmer to settle is, which pattern is best adapted to his wants. The U. S. Wind Engine and Pump Co., of Batavia, Kane Co., Ill., make both the sectional and the solid wheel mills. The Halliday, a sectional wheel wind-mill, has been for many years before the public, and is in use throughout a large extent of country. The U. S. solid wheel wind-mill is a later pattern, which is also made by the company named above. Both are good.

Death to Insects.—It is now settled beyond question that the cheapest and most effective means of keeping down the potato beetle are arsenical poisons. Of these the London-purple is very cheap and easily handled. In the Bulletin of the Ohio Agricultural Experiment Station for March, 1889, Clarence M. Weed gives the following: "The pest is so easily kept in check by the use of London-purple or Paris-green, that it hardly pays to try any other method." One pound of the poison to 150 gallons of water is the mixture he advises, and then adds: "Apply early. Do not wait till the vines are three-fourths eaten but kill off the first brood, and the later broods will trouble you much less."

Reliable Farm Machinery.—The attention of our readers is invited to the advertisement, in this paper, of the old and reliable Empire Agricultural Works, Cobleskill, N. Y., over thirty years under the same management; at which the celebrated Fearless threshing machines, the leading Tread-power machines of America and of world-wide reputation, as also other machines, are built. These works are also the Eastern headquarters for the famous Smalley ensilage-cutters, which alone is a sufficient guarantee of their excellence, as the aim of the proprietor, Minard Harder, whom, we advise persons designing to purchase, to consult, is, to offer no goods except such as possess "the highest standard of excellence."

ANIMAL AILMENTS.

Warts on Cow.—Edward Cameron, Orange Co., N. Y., has a heifer that has extensive patches of warts on the udder, teats and body. Treatment—With white saddler's silk tie the small ones on the teats or elsewhere, where the base is small. Paint the others with tincture of iodine every night or morning for three or four days, then grease the parts to which the iodine has been applied, and wait a few days. The heifer may need alterative medicines if this plan does not succeed.

Cough Remedy for Cows.—Samuel Davidson, Mead Co., Ky., wishes to know a remedy for cough in a cow. If it arises from a cold, give flaxseed meal gruel in two-quart doses, three to six times a day. Just before calving, the cough should be relieved as speedily as possible. To the gruel may be added, a tablespoonful of the following mixture: Compound sirup of squills four ounces, powdered sal ammoniac (muriate) one ounce, laudanum two ounces, molasses half a pint. Dose, a tablespoonful in each portion of gruel. The cow should have grass, or hay thoroughly wet, by pouring over it hot water. Roots or grass are best. Have a warm, dry, well-bedded box stall, and blanket in cold weather.

Dropsical Swelling of a Horse.—Frank Burger, Dane Co., Wis., has a gelding that has swelling of the hind leg. The case was a long-neglected kidney trouble. The horse is too valuable and useful an animal to be neglected, and we advise all owners of animals to promptly consult veterinary surgeons when the case is beyond their own experience. A single call of a surgeon may often cut short a malady that may result in unsoundness, crippling, lameness, or chronic disease that cannot be cured, or worse, in the loss of a valuable animal, or in a cruel, criminal neglect which should show the humane feelings of any man, and especially of a farmer. We advise you to call a veterinarian.

Acute Indigestion in a Cow.—Mrs. James P. Leighton, Belknap Co., N. H.: From the description given we conclude that your cow had acute indigestion, and as usual accompanied with constipation. We think early and prompt treatment would have saved her. Glauber salts in half-pound doses in thin, warm gruel, containing in each dose an ounce of compound tincture of gentian, every four hours, would have been successful and humane. The "cow doctor" you called was an innocent kind of "know-nothing and do-nothing." As a general rule, these people are cruel to poor dumb brutes and expensive to owners. They too often torture or kill, or do both, to animals. They saw off the horn of a cow, and pepper and salt the tender and sensitive textures within, or split the tail and apply the same stupid and irritating substances to the cut and raw surfaces. We feel it to be our duty to commend your humane act in calling in your family physician, who, though too late, did for your dying cow what he would have done for a similarly suffering patient. He soothed the suffering and assuaged the agony of death of a poor brute. He performed the part of a kind physician. If human doctors could get rid of the absurd whim that it detracts from the character and standing of a physician, to relieve the sufferings of a poor dumb brute, it would be well for every community. Sick animals require similar treatment for the same diseases that affect in common both the human person and the cruelly neglected animal. The diagnosis—the finding out what ails the animal—is, like the diseases of young children, sometimes difficult to ascertain. It is a thorough questioning of silent nature. It is this which calls for the skill, knowledge and experience of the physician and the veterinarian.

Hog Cholera.—The more important facts about hog cholera, which have been definitely determined by the investigations of Dr. D. E. Salmon, chief of the Bureau of Animal Industry, have been summed up in the valuable work just published by the United States Department of Agriculture, and may be stated as follows: 1. The disease is a contagious and infectious one, and may be contracted by a healthy hog from a diseased one, or from infected premises, and the contagion may be carried from farm to farm in various ways. 2. It is a bacterial disease, the germ having been first accurately figured and described in 1885, and studied almost constantly since that time. 3. The germ is readily cultivated in various media, is transmissible to other animals than hogs, from which it may be retransmitted to swine and produce a fatal form of the disease. 4. A fatal disease similar to hog cholera, which has been named "swine plague," to distinguish it from the disease first met with, was discovered during the progress of these investigations. It is also a germ disease, widely distributed and fatal, and may exist as a complication in outbreaks of hog cholera. 5. The disease may generally be prevented by isolation of the animals and by cleanliness combined with simple measures of disinfection. 6. Outbreaks of hog cholera are to be checked by separating the well from the diseased animals and practising disinfection. 7. Infected premises may be made safe for the admission of a new herd by disinfecting with lime or other disinfectants and allowing three to six months to elapse after the disease has disappeared. 8. Medicines have not been found to greatly influence the course of the disease. 9. Inoculation has been tested in almost every form as a preventive without satisfactory results. 10. Hog cholera is apparently identical with a disease which has recently been described in various parts of Europe.

The Art of Jelly-Making.

SHIRLEY DARE.

There are jellies and jellies. Ordinarily it is safe to pass by the rasping sweetmeat whose taste is lost in sugar, or is a sharp acid, with a decided flavor of the pan in which it was made. You can taste the tin or metal in most of the jellies and fruit preserves shown. A few times in life, however, you come upon such a glass of jelly as I found in a Pilgrim household, at old Plymouth—wild grape jelly, kept three years in a pot of old gilt crystal, which perfumed the house when opened with its wild, fine odor. Jelly-making is an art, the height of the housekeeper's skill, for it demands keen taste, nicety and promptness to insure perfection, rather than the twenty minutes' boiling and the pound for pound of sugar which most women imagine all there is of jelly-making.

To have the soul of the fruit in its flavor, it must be picked in its first firm ripeness, just when the dew is dry on a sunny forenoon, about ten minutes from the boiling pan. The stoneware preserving pans are best for all fruit uses, and a kerosene stove, with an iron stove-lid under the pan, works quickly, without overheating jelly or jelly-maker. Only a quart of juice should be pressed at a time, and made up as quickly as possible. Standing, it loses flavor and develops sharp ferment, which gives the edge to so much of the jelly offered. Everything must be scrupulously clean, and a bowl of clean water ready for rinsing spoons and cups.

The finest jellies are made without heat. A sunny day before a storm, when the teakettle boils away fast, is the best day for boiling jelly, as the juice evaporates faster, but jelly by the cold process needs fair, settled weather. A damp, muggy day is enough to spoil any preserves made on it. Use the best confectioners' sugar for jelly, or roll and sift the granulated until it is fine and will dissolve quickly. Have the sugar measured and glasses ready before pressing the juice. Press and strain through flannel, without squeezing or stirring, but moving the juice to fresh parts of the straining cloth, as it becomes clogged. On careful straining depends the crystal clearness of the jelly which is read of, alas! oftener than seen. Repeated straining lessens the flavor. What remains on the cloth should be scraped off for marmalade, but jelly requires the first run of the fruit. Use three-fourths of a cup of sugar to a cup of strained juice, stirring spoonful by spoonful into the bowl, and continuing to stir till the sugar is entirely dissolved—ten to fifteen minutes. Then pour into glasses and set in the full sunshine. A table on an open porch, or a broad shelf outside the window, is the best place, covering each tumbler with one of the small squares of glass that come in honey boxes. In time moisture gathers on the underside of the glass, and it must be turned and wiped dry, changing the position of the jelly to keep it always in the sun. Sometimes it must be exposed for a week before it comes firm, but usually two or three hours is enough, and the juice jellies on the edge of the bowl before pouring out. The flavor of the fruit is kept in full freshness by this method, and the jelly is not so likely to mold as when boiled. When thoroughly firm, lay disks of white paper cut to fit the glass, dipped in salad oil and drained, on the top of the jelly, and cover with tin covers or paper brushed on both sides with white of egg or the thick water of boiled rice. Keep all preserves in a dry, cold, dark place, away from other provisions.

For boiled jellies, set the juice boiling rapidly, and sift in the heated sugar, spoonful by spoonful, not to check the boiling, using equal care neither to scorch nor cool the fruit. The best manufacturers say the secret of high flavor is to keep fruit boiling as rapidly as possible till the juice is evaporated enough to jelly, which should be ten minutes, but in domestic methods is twenty. The only way to tell when it is done is to drop a little on a cold saucer, to see if it thickens. Then take it off, cool in a draft, and pour into dry, clean glasses, which seal as before. Powdered sugar on the top protects from mold as well as the oiled paper, and paraffine paper, closely fitted, may be used in place of the latter. More care should be given to secure variety of flavor and fruits for jelly.

Apple jelly is fine if made from high-flavored, acid, white-fleshed varieties, like the Orange Pippin, or Bellflower, boiling the skins and seeds, tied in cheesecloth, with the juice, which heightens the flavor. For the finest jelly, press two quarts of cider and put it to simmer; pare five pounds of apples, slice and boil in the cider over a brisk fire till the fruit is melted down; strain and boil again with ten ounces of sugar to the pound of juice. This may be flavored with lemon or orange peel, with rose petals—five ounces being required for the above amount of apples—or with quince.

The quince itself is at the head of fruits for preserving, and should be boiled with all the seeds and clean parings to get its high flavor. The Japanese quince is esteemed as a jelly fruit in Southern States, where it fruits freely.

Wild grape jelly is the finest known if properly made, by cooking the whole grapes in a stone pot in the oven before straining. White currant jelly is delicious. Cherry jelly is piquant in the highest degree, but should be cooked without stirring the fruit. Barberry jelly is valuable for consumptives as well as a high relish for game. Boil four pounds of picked barberries in three quarts of water until soft; strain and boil with ten ounces of sugar to the pound of juice. Pineapple jelly is one of the whitest and clearest kinds, admired for a luncheon treat with ice cream. Green gages make a subacid jelly, very pleasing to serve with cake at an old-fashioned tea.

New Publications.

A TREATISE ON MANURES, or the Philosophy of Manuring. A Practical Handbook for the Agriculturist, Manufacturer and Student. By A. B. Griffiths, Ph. D., F. R. S. (Edin.) F. C. S.

The subject of manuring lies at the very foundation of successful farming. Any man who continues to draw steadily on his bank account and never makes deposits must reach the end; and the soil is the farmer's bank. The present work deals with the entire subject of manures in a broad and comprehensive manner. It is at once profoundly scientific and thoroughly practical. After a preliminary chapter on vegetable physiology, which clears the ground for what is to follow, every manurial substance known to agricultural science and practice is treated separately, and its constituents presented in tabular form. Special chapters are devoted to special fertilizers. The manufacture of phosphatic and other artificial fertilizers is treated in a very clear and satisfactory manner, and practical directions are given for testing guanos and other commercial fertilizers. The chapter on iron sulphate as a manure opens up a rich vein hitherto almost unknown. The book, though it is not free from occasional flaws, is a most welcome and valuable contribution to agricultural literature. Sold by the Orange Judd Co., New York. Price, including postage, $3.00.

From a Contemporary of George Washington.—In renewing my subscription, I wish to say that I am now in my ninetieth year, and am probably among your unique subscribers. I have taken the AMERICAN AGRICULTURIST for thirty-three years or more—not because I was a farmer, as I never owned a farm or lived on a farm. I never owned a farm animal except a few fowls. I can say what few of your subscribers can, that I was a contemporary of George Washington, being six weeks old when he died. I do not read as much as I did formerly, but the younger members of my family say they cannot do without the old AMERICAN AGRICULTURIST.

JAMES MATTHEWS, Rutland Co., Vt.

Sample and Descriptive Price List free by mail.

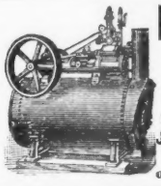
H. W. JOHNS MANUFACTURING CO.,

SOLE MANUFACTURERS OF

H. W. Johns' Asbestos Roofing, Fire-Proof Paints, Building Felt, Steam-Pipe and Boiler Coverings, Asbestos Steam Packings, Gaskets, etc. Vulcabeston Moulded Rings, Washers, etc.

87 MAIDEN LANE, NEW YORK.
Chicago, Philadelphia, Boston, London.

JONES
HE
PAYS THE FREIGHT.
3 Ton Wagon Scales,
Iron Levers, Steel Bearings, Brass Tare Beam and Beam Box for
$60.
Every size Scale. For free price list mention this paper and address
JONES OF BINGHAMTON,
BINGHAMTON, N. Y.



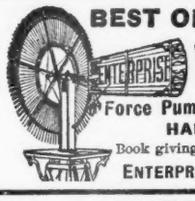
FARM ENGINES
Upright and Horizontal, Stationary, Portable and Semi-Portable.
3 to 16 Horse Power.
Illustrated Pamphlet Free. Address
JAMES LEFFEL & CO.
SPRINGFIELD, OHIO,
or 110 Liberty St., New York

THE PERKINS'
Wind Mill
is the Strongest and Best Self-Regulating Wind Mill made. Full instructions for erecting sent with the first mill. **All Wind Mills warranted.** For Circulars and Prices address
The Perkins' Wind Mill & Ax Co.,
Agents wanted. **Mishawaka, Ind.**

Winger's Royal Wind Mill,
Feed Grinder, Tank Heaters, Motion Converters. All indispensible to
Farmers.

ALSO
Pumps, Tanks, Cylinders, Pipe, etc.
Write **Winger,** The Windmill Man, Freeport, Illinois.

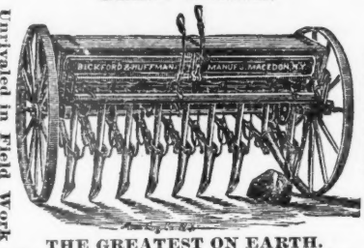
BEST OF THE CLASS!



WINDMILLS
Force Pumps, Ear Corn Slicers,
HANDY CARTS.
Book giving full information sent *free.*
ENTERPRISE CO., Sandwich, Ill.

THE FARMERS' FAVORITE
GRAIN DRILLS.

Unrivaled in Field Work the World Over.



Unexcelled in Material, Manufacture and Finish.

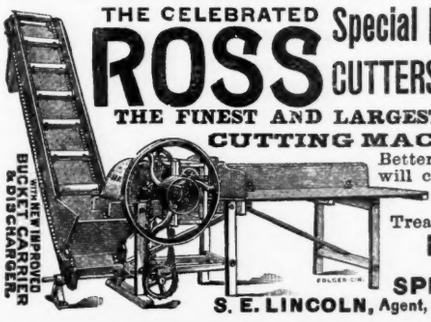
THE GREATEST ON EARTH.
Send for Circulars. Mention this paper.
BICKFORD & HUFFMAN, Macedon, N. Y.

Beecham's Pills—Act like magic on a weak stomach.

SUDDEN PAINS.

The time of year is at hand again when old heads and young become imprudent, get overheated, cool off suddenly, catch cold, rheumatism, nervous disorders, and numerous other troubles. The only thing to do after having contracted one or more of these pains is to cure yourself as quickly as possible. Small pains are not to be neglected except at the risk of serious consequences. Remove them at once. It can be done by an application of one or more of ALLCOCK'S POROUS PLASTERS, recognized the world over as the best external remedy ever made.

Beware of imitations, and do not be deceived by misrepresentation. Ask for **ALLCOCK'S,** and let no explanation or solicitation induce you to accept a substitute.



THE CELEBRATED
ROSS Special **ENSILAGE** and FODDER CUTTERS, CARRIERS and POWERS.
THE FINEST AND LARGEST LINE OF FODDER CUTTING MACHINERY IN THE WORLD.
Better made. Stronger, more Durable, and will cut faster with less power than any other Cutter manufactured. Send for our Illustrated Catalogue and Treatise on Ensilage and Silos. Address
E. W. ROSS & CO.,
MANUFACTURERS,
SPRINGFIELD, OHIO, U. S. A.
S. E. LINCOLN, Agent, 146 WEST MAIN ST., ROCHESTER, N. Y.

WHITMAN'S HAY, STRAW, WOOL AND COTTON PRESSES.

STEAM OR BELT POWER
1 BALE IN EVERY MINUTE
HALF CIRCLE REVERSABLE
HAS NO EQUAL
STEEL FULL CIRCLE, 10 TONS IN CAR
SEND FOR CIRCULARS.

WHITMAN AG'L. CO., GENERAL MANUFACTURERS, St. LOUIS, MO.

---

48 CENTS.

OUR JULY OFFER: A common knive like this will cost you 75c in any retail store, but these blades are of the highest quality razor steel, file-tested and KNOWN TO BE GOOD before sending out. It is cheap for a silver dollar, but our price is 48c postpaid; 5 for $2. Boys' 2-blade, 25c; Girls,' 25c; Ladies' pearl, 50c; **Butcher** 6 in., 50c; 8 in. shears, 75c; razor steel paring knife, 25c, all postpaid. Send for illustrated free list, also "How to Use a Razor."

Maher & Grosh,
4 S. Street,
TOLEDO, OHIO.

Sample Patent Barbless Hook Free with each knife ordered in July.

SMALLEY GOODS—including ENSILAGE AND FODDER CUTTERS, SWEEP AND TREAD HORSE POWERS, DRAG & CIRCULAR SAW MACHINES, FARM ENGINES & PLOWS, are positively ahead of all others in the country, **and so warranted.** Shipped to any responsible farmer in the U. S. or Canada, subject to **30 days' trial,** and to return **at our expense** if not proving just as warranted. We are prepared to build Carriers any length, guaranteed to run at any desired angle to suit silos, and claim Smalley Carriers positively superior to all others. Our 1889 "Why it Pays Pamphlet" should be read by every intelligent farmer interested in dairying or stock raising. It contains the very latest information relative to economical stock feeding. Will be mailed free to responsible farmers only, upon application, providing *mention is made of paper* in which this advertisement was noticed.

SMALLEY MFG. CO.
MANITOWOC, WIS.

N. B.—We control *original patent* for Bucket Carriers. All others are *frauds or infringements.*

Ask for *Special introduction prices and terms.*

The SMALLEY CUTTER, with Improved Bucket Carrier. **SMALLEY TREAD POWER WITH GOVERNOR.**

ANSWERS TO CORRESPONDENTS.

Tent Caterpillars.—Mrs. E. Spofford Mears, Clermont County, Ohio: The tent caterpillar (*Cleisiocampa Americana*) possesses no power to sting, but the bristly hairs with which they are covered are irritating to a delicate skin. The moth remains in the chrysalis state from two to three weeks, according to the weather.

Seeding to Clover.—F. E. Scanland, Accomack Co., Va.: If your clover seed failed to come up, after being drilled in with oats, it was probably put in too deeply. As a general rule seed should never have more than eight times its own diameter of covering. Clover seed will lie a long time in the ground without germination, if it is an inch below the surface.

How Fish Breathe.—N. A. D., Pittsburg, Pa.: You were correct in maintaining that fish cannot live in water without air. The gills of fish perform the same functions as the lungs of land animals in oxygenizing the blood. When fish are confined in so small a quantity of water that the oxygen becomes exhausted they perish from asphyxia, as the British prisoners died in the Black Hole of Calcutta.

Locomotive Fireman.—N. B., Queens Co., N. Y.: To obtain a situation as fireman on a locomotive engine, make application to the Superintendent, with references and evidences of good character. The application will be likely to go on file with others until a vacancy occurs. In many cases the most certain path to a place on the foot-board is through the repair shops of the company.

Fertilizers for Wheat.—Charles Sander, Posey Co., Indiana: The best aid for raising a good crop of wheat on your naturally rich soil, which has been run down by excessive cropping, would be some complete fertilizer. Send for circulars to any of the dealers in fertilizers whose advertisements appear in our pages. They give prices and full particulars.

Lucerne or Alfalfa in Michigan.—H. A. Nichols, Barry Co., Mich., asks, "Will alfalfa do well as far north as here?" We see no reason why it should not. The well established lucerne will stand severe winters without injury. The main point is to get it well started. It is for this reason that it is frequently sown in rows and hoed to keep it clean. Try it on a small scale. Where red clover succeeds we shall not be likely to find a plant that can take its place to advantage.

Life Period and Maturity.—John Wilson, Warren Co., Ohio: As a general rule, the natural life of animals is about five times as long as the period required to attain maturity. This rule may be modified by artificial conditions. Thus, certain breeds of cattle, sheep and swine have been brought by careful systems of breeding and feeding to mature at a much earlier age than the original period, without materially shortening the length of life. But these exceptions do not affect the general rule.

Care of Goldfish.—Miss Hissie Young, McDowell Co., N. C.: Change the water at least once a day, and in hot weather twice is better, giving pure and fresh. Feed two or three times a week with finely scraped shreds of lean beef. On no account touch them with the hands. The most convenient way to change the water is to draw it out with a syphon, but in the absence of such a convenience it may be poured out, great care being used to avoid pouring out the fish with it.

Bladder Plums.—W. M. Purifry, Wilcox Co., Ala.: The curious bladder-like fruit from your Wild Goose plum trees are produced by a fungus which attacks the trees when in bloom, or the fruit as soon as it begins to form. While this fungus changes the entire structure of the plum, it becoming a light, hollow or puffy ball, still it does not appear to injure the leaves or wood of the tree. We have known wild plum trees in this State to be loaded with these bladder plums—as they are called here—for many seasons in succession, without showing any other signs of disease. We believe this plum fungus has been given a Latin name, but beyond its name very little is known of its [illegible] or why it should attack the wild plums of this country in preference to those of Europe. This species of fungus appears to be as widely distributed as the native plum, and it is frequently far more destructive than the plum Curculio, although our most noted pomologists do not refer to it in their works, at least we find no reference to it in any of the standard works consulted.

Grapevine Flea Beetle.—Mrs. S. N. Mason, Somerset Co., N. J.: The small steel-blue beetle found feeding on the leaves of your grapevines is the *Haltica chalybea*, sometimes called the grapevine flea beetle, although it feeds upon the leaves of many other species of plants besides the grape. In some localities and seasons it is a great pest, then it may disappear and be comparatively scarce for years. Dusting the vines with white hellebore, slug shot, London purple and similar insecticides, will usually drive away this pest, even if they do not destroy them. Dry wood ashes dusted over the leaves will sometimes disperse the beetles, and dry plaster into which a little spirits of turpentine have been dropped and thoroughly mixed will render the leaves offensive to such pests.

Antiopa Butterfly.—Subscriber, Bergen Co., N. J.: The large stoutly-spined caterpillars with a black, hairy body spotted minutely with white, and a row of eight brick-red spots on the back, are those of the *Antiopa* butterfly. This insect is a native of Europe, but is now very widely distributed over the world. The butterfly is purplish brown above, with a broad buff yellow border, in which there is a row of pale blue spots. These butterflies may be seen flying about from early spring until late in autumn; the latest brood live over winter, and may often be found attached to the rafters and beams in barns, where they remain dormant until warm weather returns. The caterpillars are more common on the willow than any other tree, but they often attack the elm, stripping the leaves from the infested branches. Dusting the leaves with Paris green, London purple and similar insecticides, will quickly destroy these caterpillars.

Fruits for Northwestern Georgia.—A subscriber in Jefferson Co., Ala., desires information about the best varieties of fruits for his locality. Samuel H. Rumph, chairman of the State Fruit Committee of Georgia, reports to the American Pomological Society that the most largely planted varieties of apples are the Red Astrachan, Early Harvest, Red June, Simmons' Red, House, Carter's Blue, Shockley, Equinetely, Mangum, Stevenson's Winter, Yates and Ben Davis. The Leconte pear is planted largely. In fact, all the Japan and Chinese pears seem to do well. Among peaches, the earliest varieties prove the most profitable. The Wild Goose plum is more extensively cultivated for market than any other variety. Among grapes, the Ives, Concord and Delaware are recommended for Northern and Middle Georgia. The Cuthbert and Shaffer raspberries are the most profitable varieties. Strawberries can be successfully grown in almost every section of the State. The Newnan, Hoffman and Sharpless are the most popular varieties.

Food for Dairy Cows.—A. G. Burchard, Maui, Hawaian Islands: No course could be better than that proposed, of breaking up the wild sod, raising fodder corn or sorghum until the ground is thoroughly subdued, and then seeding to orchard grass and red clover. It is not advisable to sow the fodder crops broadcast. Fodder corn and sorghum should always be planted in drills, not less than three-and-a-half feet apart, and the ground kept thoroughly cultivated between the drills. Otherwise it will make a sickly, watery growth, and possess very little nutritive value. If the pasturage is supplemented with crushed corn, it should not be fed clear, as it runs too much to fat alone. Mixed with an equal amount of wheat or rye bran, or one-fourth its own weight of linseed or cotton-seed meal, the corn makes an excellent food, except near calving time, when there is great danger that such heating food may lead to milk fever. In all cases of feeding cotton-seed meal, it is best to begin with small quantities—not more than one pound a day, and increase gradually to four pounds daily mixed with bran or crushed corn. In feeding the fodder corn or sorghum, discontinue the ration of crushed corn, and give bran alone or mixed with oil-meal as above.

Implements for Corn Raising.—T. M. Morgan, Fauquier Co., Va.: The implements used by the most extensive corn growers for raising a crop of corn with the least amount of manual labor have been so greatly improved as to almost revolutionize corn culture. The first process, of course, is to plow the soil, which is done on large farms by a four-horse gang plow, with two mold boards, each turning a fourteen-inch furrow. It is then pulverized with an Acme, a Cutaway or a Disk harrow, though on some of the bonanza farms the harrows are thirty-two feet wide and drawn by eight horses. The planting is done with a check-rower dropping two rows at once. As soon as the corn is up, or before, a broad smoothing harrow is run lengthwise of the rows, and this is repeated every ten days or so, until the corn is six inches high. This keeps the surface mellow and kills the weeds, without danger to the more deeply-rooted corn. This is followed by a good two-horse sulky cultivator, which keeps the surface loose, but does not dig down near the roots. After the second cultivation the corn is "laid by," the work being all done except harvesting. The great want is a machine which will do for the corn crop what the mower and reaper have done for hay and small grains.

What Crops Should Manure be Applied to? E. L. Beebe, East Bloomfield, N. Y.: This is an important question and cannot be definitely answered. It depends much on circumstances. If we made manure enough on the farm to produce maximum crops of everything we sow or plant, we should probably cover every acre of sod with twenty tons of manure per acre, and plow it under for corn or potatoes. Sow barley or oats in the spring after corn and follow with winter wheat, and give the wheat a good coat of well-rotted manure either spread on the surface after the wheat was sown or plow it under, sowing the wheat. Seed down with timothy in the fall and with clover in the spring. Mow for hay and then pasture giving the pasture a top-dressing of well-rotted manure in August or September, or whenever it is most convenient to draw out and spread the stuff! But there are few such farms in this country. Most of us do not have half or quarter the necessary amount of manure. We buy fertilizers, generally "phosphates," and then we are in such a way as will best enable the crops to get nitrogen and potash and other plant-food out of the soil. If instead of trying to get nitrogen from the accumulated organic matter in the soil we aim to raise large crops by *buying nitrogen* in the form of nitrate of soda, dried blood, tankage, etc., we should use it on such crops as will bring in the most money per acre—such as apples, pears, peaches, strawberries, raspberries, onions and other so-called garden crops. As a rule the more labor a crop requires per acre the better will it pay to use fertilizers. We lose less by growing half a crop of oats than half a crop of potatoes, because the cost of seed, planting, cultivating, hoeing and digging a crop of potatoes is three or four times as much per acre as the cost of seed, and harvesting, and threshing a crop of oats. And this principle applies to nearly all the crops that we raise. At present prices, we cannot afford to buy plant-food for corn, oats, grass and wheat. We must get it from the soil. This is emphatically true in regard to nitrogen. If phosphates will enable plants to get nitrogen from the soil, their use will be highly profitable.

Catalogues Acknowledged.

MINARD HARDER, Cobleskill, N. Y.: Catalogue of the Smalley ensilage and fodder cutters, giving a full description of these excellent machines, together with much useful instruction about ensilage, also a catalogue of the Fearless threshing machine, the advantages of which have been recognized wherever they have been used. Testimonials as to the excellence of these machines made by this company accompany these catalogues.

J. C. HARRIS, Venango, Pa.: Illustrated and descriptive circular of high class fowls, White Plymouth Rocks, White and Golden Wyandottes and White Javas specialties.

DELANO MOORE, Presque Isle, Me.: Catalogue of field and garden seeds, Moore's rutabaga a specialty.

UNITED STATES NURSERIES, Short Hills, N. J.: Price list and special offer of imported orchids.

It is a True Friend.—The AMERICAN AGRICULTURIST, like a true friend, grows better and better, while its new face has a charm to draw the young to search its pages for useful and elevating knowledge. M. M. J., Center Co., Pa.

STORE KEEPER.—Yes, my friend, I can cheerfully recommend to you a "SUCCESS" pad, and your horse will not have sore shoulders while you continue to use the same.

I have sold these pads for five years now, and have never known of it if any purchaser has been dissatisfied.

FARMER.—Well, I'll try one. My neighbors all use them, and are satisfied. I tried another kind, and "Old Domby's" shoulders got worse.

GUARANTEE Sore Shoulders and Galls caused by the collar, are positively cured and prevented by the use of a "Success" Sweat Pad.

CAUTION Every genuine "Success" is branded with this Trade Mark. Ignore imitations, they do not possess the qualities of "Success," and can not give the same satisfaction. FOR SALE BY THE HARNESS TRADE IN GENERAL.

E. L. McCLAIN MFG. CO.

Only Manufacturers. GREENFIELD, OHIO.

We will furnish the most economical roofing and siding, all styles. Also Metallic Shingles from Iron or Steel with full directions and low prices.

GARRY IRON ROOFING CO., Cleveland, O.
Mention Agriculturist.

SUMMER NECTAR.

KNAPP'S ROOT BEER EXTRACT

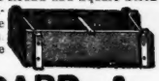
MAKES THE MOST DELICIOUS
HOME DRINK
in the world. It is compact, concentrated, convenient. No special facilities are required for its use. During the hot months it is the need of **every one** to have just such a cool, refreshing
SUMMER BEVERAGE
within arms reach. **25 cent bottles make 10 gallons.** Price 25c., 50c. and $1.25.
DRUGGISTS AND GROCERS.

WIND MILLS
34 YEARS Experience.
THE HALLADAY PUMPING MILL is acknowledged the Standard Wind Mill of the World and is made in 18 sizes, 6 to 60 ft. diameter, 1 man to 40 horse power. It is adapted to pumping water for Stock and Dairy Farms, Ornamental and Village Water Supply and Fire Protection, Railway Water Stations, Irrigation, Drainage, etc.
THE HALLADAY is made upon honor and guaranteed THE MOST POWERFUL, DURABLE and, BEST REGULATED, STORM DEFYING Wind Mill Made.

U. S. SOLID WHEEL WIND MILL
7 sizes, 10 to 22 feet diameter. Not cheaply made but heavy and strong in construction. These Mills are taking the lead of all Solid Wheels on the market, and are guaranteed the Best of their class.

PUMPS
We make a very complete line of WIND MILL, HAND AND POWER PUMPS IRON, BRASS AND BRASS LINED CYLINDERS. Our 3 Way Force Pumps have no equal.

TANKS We make the largest assortment of Tanks on the market, consisting of Round, Half-Round and Square Stock Tanks, Milk Cooling Tanks, Storage and House Tanks Special sizes made to order.



STANDARD HAY TOOLS
For stacking out in fields and mowing away in barns. The use of a good Hay Carrier and Fork a few hours before a storm, may save many times their cost. We make the most complete line of Horse Hay Tools on the market, consisting of Anti-Friction, Swivel, Reversible and Rod Hay Carriers, Harpoon and Grapple Hay Forks, Pulleys, Floor Hooks, etc.

We also make the HALLADAY STANDARD GEARED WIND MILL, in 11 sizes, 1½ to 40-horse power, Corn Shellers, Horse Powers and Jacks, Stalk Cutters, Feed Grinders, Saw Tables, Tank Heaters, &c. All goods guaranteed. Send for Catalogue and Prices. Reliable Agents Wanted in all unassigned Territory.

U. S. WIND ENGINE & PUMP CO.
BATAVIA, ILLINOIS, U. S. A.
BRANCH HOUSES:—Kansas City, Mo., Omaha, Neb., Fort Worth, Tex., Boston, Mass.

"HAMMOND'S SLUG SHOT"
Kills Cabbage Worms, Etc. Safe, Sure and Cheap.
Ten years' record to back it. Send for pamphlet to FISHKILL-ON-HUDSON, N. Y. SOLD BY SEED DEALERS.

Report of Fertilizer Analyses of the Pennsylvania State Board of Agriculture.

No.	Name of Fertilizer.	Date.	Value.	Our Price.
807	Pure Dissolved Bone,	May 7, '87.	$42.37	$32.00
820	Ammoniated Bone Phosphate,	" "	31.24	30.00
405	Ammoniated Bone and Potash Phosphate,	May 26, '88.	23.82	20.00

Average valuation 17½ % higher than selling price. Manufactured by
C. H. DEMPWOLF & CO., YORK CHEMICAL WORKS, YORK, PA.

LAWN SETTEE.
4 ft. long. Price $10.00.

RUSTIC WORK.
—IN—
Artistic and Attractive Designs.
Elegant for ornamenting residences.
RUSTIC CHAIRS, SETTEES, VASES,
WINDOW BOXES, STUMP BOXES, BIRD HOUSES,
SUMMER HOUSES, GATEWAYS, BRIDGES, ARBORS, ETC
Hanging Baskets in 5 sizes, 8, 10, 12, 13 and 15 inches in diameter, price 75c, $1, $1.25, $1.50, and $2. Sent by express to any part of the U. S., on receipt of price.
Send for Illustrated Catalogue.
Rustic Mfg. and Construction Co.,
29 Fulton St., New York, U. S. A.

HORSE POWERS.
LATEST IMPROVEMENT
Machines for SAWING WOOD with Circular and Cross-Cut Drag Saws. Also, Machines for THRESHING and CLEANING Grain.

Acknowledged by all to be
THE BEST
considering
Easy Draft, Durability, Quantity and Quality of Work.
48-page pamphlet Free. Address **A. W. GRAY'S SONS,**
PATENTEES AND SOLE MANUFACTURERS,
MIDDLETOWN SPRINGS, VERMONT.
Mention AMERICAN AGRICULTURIST.

PAINLESS EFFECTUAL
BEECHAM'S PILLS
THE GREAT ENGLISH MEDICINE
WORTH A GUINEA A BOX

For Bilious and Nervous Disorders, such as Wind and Pain in the Stomach, Sick Headache, Giddiness, Fullness, and Swelling after Meals, Dizziness and Drowziness, Cold Chills, Flushings of Heat, Loss of Appetite, Shortness of Breath, Costiveness, Scurvy, Blotches on the Skin, Disturbed Sleep, Frightful Dreams, and all Nervous and Trembling Sensations, etc. THE FIRST DOSE WILL GIVE RELIEF IN TWENTY MINUTES. This is no fiction. Every sufferer is earnestly invited to try one Box of these Pills and **they will be acknowledged to be a wonderful Medicine.**—"Worth a guinea a box."—BEECHAM'S PILLS, taken as directed, will quickly restore females to complete health. For a

WEAK STOMACH; IMPAIRED DIGESTION; DISORDERED LIVER;

they ACT LIKE MAGIC: **a few doses** will work wonders upon the Vital Organs; Strengthening the Muscular System; restoring long-lost Complexion; bringing back the keen edge of appetite, and arousing with the ROSEBUD OF HEALTH the **whole physical energy** of the human frame. These are "facts" admitted by thousands, in all classes of society, and one of the best guarantees to the Nervous and Debilitated is that BEECHAM'S PILLS HAVE THE LARGEST SALE OF ANY PATENT MEDICINE IN THE WORLD. Full directions with each box.

Prepared only by THOS. BEECHAM, St. Helens, Lancashire, England.

Sold by druggists generally. B. F. ALLEN & CO., 365 and 367 Canal St., New York, Sole Agents for the United States, who, (if your druggist does not keep them,)

Will Mail Beecham's Pills on receipt of price, 25 cents a box.

WELL DRILLING Machinery & Tools
ST. LOUIS VISE & ARTESIAN WELL TOOL CO.,
Catalogue Free. ST. LOUIS, MO.

"VICTOR ROCK DRILLS, WELL-BORERS and PROSPECTORS" W. WEAVER, 1605 S. Broad St., Philada., Pa.

IMPROVED. HUNDREDS IN USE.
NEW CIRCULAR **MONITOR INCUBATOR.**
A. WILLIAMS, Bristol, Conn.

240 LB SCALE 500 lb Platform, $10; 1000 lb $15; 1500 lb $20; 3¼ ton Wagon Scale, $40; 5 ton, $50. List $3.00 FREE. Am. Farm Scale Co., Chicago, Ill.

Publications Received.

ALABAMA—Experiment Station at Auburn. Bul. 5, 55 pp., Report of experiments with fertilizers. Feeding for pork. Description of barns, and dairy feeding for butter. Analysis of fertilizers, soils and feeding stuffs. Meteorolo y.

CALIFORNIA—Experiment Station at Berkeley. Report of the professor in charge to the president. Fifteen pages. Technical science. Agriculture, floriculture, entomology and botany.

CONNECTICUT—First annual report of the Storrs School Experiment Station at Storrs, 101 pp., experiments on the effect of surface tillage on soil moisture, meteorological observations, roots of plants as manure, co-operation with experiments with fertilizers, grasses, forage, garden plants and cow peas. Annual report of the Connecticut Experiment Station, in two parts. Station at New Haven. Effect of the rate or distance of planting on the quantity and quality of the maize crop. Composition of American feeding stuffs. Connecticut grains. Work of the State Dairy Commission. Examination of honey. Experiments with phosphates.

DAKOTA—Experiment Station at Brookings, Bul. 11, 8 pp., experiments with wheat, oats and barley. Bul. 12, 13 pp., practical forestry. Bul. 14, 6 pp., practical experiments with sugar beets.

IOWA—Experiment Station at Ames, Bul. 4, 140 pp., experiments with wild plums, chemical study and investigations of apple twigs, propagation of trees and shrubs from cuttings, suggestions concerning the corn root worm

KANSAS—Experiment Station at Manhattan, Bul. 5, 66 pp., comparisons of sorghum, preliminary report on sorghum blight. Sixth biennial report Agricultural College at Manhattan, for 1887-8, 126 pp., 15 illus. Advance sheets sixth biennial report State Board of Agriculture, 58 pp., on sorghum sugar industry, salt, moisture economy, water supply of Central Kansas; proceedings at 18th annual meeting of board, 128 pp., M. Mohler, sec., Topeka.

KENTUCKY—Experiment Station at Lexington, Bul. 16, Dec., 22 pp., potato experiments; Bul. 17, 24 pp., corn experiments, 1 plate showing effect of fertilizers on corn.

LOUISIANA—Experiment Station at Baton Rouge, Bul. 19, 32 pp., complete report on work with sorghum. Sugar Experiment Station at Kenner, La., Bul. 20, 70 pp., field experiments.

LOUISIANA—Experiment Station at Kenner. Bul. 20, 265 pp., field experiments with the germination of vegetables, varieties best adapted to Louisiana. Experiment Station at Calhoun. Bul. 22, 26 pp., experiments with fruit trees, grapevines, grasses, cotton, etc., etc.; corn, forage, crops, etc.

MARYLAND—Experiment Station at Agricultural College. Bul. 3, 14 pp., experiments with fodder-corn and fodder-cane.

MASSACHUSETTS—Experiment Station at Amherst. Bul. 33, 12 pp., treatise on chemical fertilizers, analyses of chemical fertilizers and other chemical substances. Sixth annual report of the Board of Control of the State Agricultural Experiment Station at Amherst; 247 pages. Feeding experiments, experiments with corn and other fodder crops; also experiments with oats, vetch, seradilla and cow peas, potatoes and potato "scab." Work in the chemical department and meteorological observations. Hatch Experiment Station at Amherst. Bul. 4, 22 pp. Steam heating versus water, greenhouses, soils, glazing experiments, experiments in destroying mildew and insects, list of fruits on the grounds of the station.

MICHIGAN—Experiment Station at Agricultural College. Bul. 45, department of botany and forestry, why not plant groves? Bul. 46, experiments with potatoes, roots, fertilizers, oats. Bul. 47, silos and ensilage, experiments with ensilage, versus corn harvested in the ordinary way. Forage plants. Bul. 48, experiments with potatoes, kale, squashes and tomatoes, illustrated with several engravings.

MISSOURI—Experiment Station at Columbia. Bul. 5 gives the results of work in the study of soil, climatic conditions, and the growth of the plant by field trial.

MASSACHUSETTS—Hatch Experiment Station at Amherst, Bul. 1, Jan., 8 pp., also Bul. 2, Feb., 4 pp., meteorological reports. State Experiment Station at Amherst, Bul. 32, Feb., 12 pp, summary of records of cows during several years' test, analyses of fodder articles; 6th annual report, 264 pp., 13 plates. Transactions Mass. hort. soc. for 1888. Part 1, 208 pp.

MICHIGAN—Experiment Station at Agricultural College, Bul. 42, Nov., 10 pp., experimental work among horses. First report Mich. forestry commission, for 1887-8, 92 pp.

MINNESOTA—Experiment Station at St. Anthony Park, Bul. 5, 68 pp., 6 plates, 17 illus., Indian corn; propagation of Russian willows and poplars from hard wood cuttings, native plums, comparative tests of varieties of cabbage new method of potato culture, frosted and rusted wheat; Bul. 6, Feb., 28 pp., experiments with frosted, rusted and stack-burned wheat.

MISSOURI—Experiment Station at Columbia, Bul. 4, Dec., 24 pp., test of tillage implements.

NEVADA—Experiment Station at Reno, Bul. 1, history, organization and work.

NEW JERSEY—Experiment Station at New Brunswick, Bul. 50, Dec., 22 pp., 3 illus., insects injurious to cabbage; Bul. 51, 32 pp., sorghum sugar industry.

NEW YORK—Experiment Station at Geneva, Bul. 14, Oct., 34 pp., grasses, clovers and forage plants, grains and by-products grasses of New York; Bul. 15, Nov., 16 pp., systematic testing of new fruits. Transactions State Agl. Soc., Vol. 24, 1883-6, 648 pp. Experiment Station at Ithaca, Bul. 3, Nov., 24 pp., 12 illus., the insectary preventing ravages of wire worms, destruction of plum curculio by poisons. Cornell University (at Ithaca) Register for 1889, 232 pp.

NORTH CAROLINA—Experiment Station at Raleigh, Bul. 59, 12 pp., purity and vitality of seed, with tests of seed sold. Bul. 60, 16 pp., 3 illus., lucerne; B. 61, Dec., Jan., 32 pp., the formulas, analyses and value of a great variety of home-made composts; B. 62, Feb., 16 pp., fertilizer analyses.

NEW HAMPSHIRE—Experiment Station at Hanover. Bul. 5, 18 pp. Fertilizers, their composition and action, plant food and its sources, etc. Bul. 6, 32 pp., use of fertilizers. Bul. 7, 16 pp., test of dairying apparatus.

NEW JERSEY—Experiment Station at New Brunswick. Bul. 52, a treatise on the weeds of New Jersey, and scale of points to aid in ranking the weeds, by Dr. Byron D. Halstead. Bul. 53, schedule of prices of nitrogen, phosphoric acid and potash. Bul. 54, conclusions on potash as a fertilizer drawn from the work of the station. Bul. 55, entomological suggestions and inquiries.

NEW YORK—Cornell University Experiment Station at Ithaca. Bul. 00, experiments on the production of lean meat in mature animals. Does heating milk affect the quality or quantity of butter? Illustrated with three plates.

NOVIA SCOTIA—Annual report of the secretary for agriculture (Halifax) for 1887, 106 pp., including full account of the Pictou cow complaint and reports of the local agricultural societies.

ONTARIO—Experiment station at Guelph, Bul. 24, 6 pp., the free power of Shorthorn cattle; B. 25, 6 pp., specimens of Holstein beef; B. 26, 6 pp., oatmeal and wheat for store cattle; B. 28, 14 pp., care of milk for cheese-making; B. 30, 6 pp., roots against grain in milk production; B. 32, 10 pp., ensilage; B. 27, 6 pp., cultivation of raspberries; B. 29, 8 pp., phosphoric acid and phosphates; B. 31, 8 pp., the better cultivation of wool; B. 34, August 31, 8 pp., linseed and oil cake; B. 35, September 17, 8 pp., notes on the cheese trade; B. 36, rust. Bureau of Industries at Toronto, crops and live stock notes.

OREGON—Experiment Station at Corvallis. Report of the horticulturist, preparation and notes on proposed work.

OHIO—Sixth annual report Experiment Station at Columbus, for 1887, 338 pp., including experiments with wheat, corn, oats and other grains, also with potatoes, other garden vegetables and small fruits; Bul. 7, 20 pp., corn-fertilizer experiments.

OREGON—Experiment Station at Corvallis, Bul. 1, 12 pp., history and organization.

PENNSYLVANIA—Experiment Station at State College, Center county, Bul 6, 16 pp., tests of varieties of wheat, oats, barley, potatoes and forage crops.

SOUTH CAROLINA—Experiment Station at Columbia. Bul. 5, experiments with oats and wheat.

SOUTH CAROLINA—Ninth report Board of Agriculture, 244 pp., with analyses of fertilizers.

TENNESSEE—Experiment Station at Knoxville, Bul. 3, 28 pp., 8 illus., weeds of the farm.

TEXAS—First annual report Department of Agriculture, 318 pp., Experiment Station at College Station. Bul. 4, 20 pp., root rot or blight of cotton.

VERMONT—Experiment Station at Burlington, Bul. 13, 12 pp., methods of cutting and planting potatoes, fertilizer analyses.

VIRGINIA—Report State Board of Agriculture, 164 pp., including analyses of fertilizers, 38 pp., and a paper on immigration.

WISCONSIN—Report of farmers' institutes, Bul. 2, 352 pp., 17 illus., with separate departments devoted to horticulture, educational matters, ensilage, cattle, horses, dairy, sheep and swine. Experiment Station at Madison, Bul. 18, Jan., 36 pp., constitution of milk and separation of cream.

WISCONSIN—Experiment Station at Madison. The constitution of milk, some of the conditions which affect the separation of cream. Bul. 19, silo building and filling, varieties of corn, changes in the soil, and feeding rations.

United States Department of Agriculture. Bul. 1, 78 pp., Organization of the Agricultural Experiment Stations in the United States. Chronological statement of the organization of the experiment stations in the United States. List of the agricultural schools and colleges in the United States. List of experiment stations in the United States. United States Legislation regarding the experiment stations, and a perfect account of the experiment station movement in the United States.

True Economy

It is true economy to buy Hood's Sarsaparilla, for "100 Doses One Dollar" is original with and true only of this popular medicine. If you wish to prove this, buy a bottle of Hood's Sarsaparilla and measure its contents. You will find it to hold 100 teaspoonfuls. Now read the directions, and you will find that the average dose for persons of different ages is less than a teaspoonful. This is certainly conclusive evidence of the peculiar strength and economy of Hood's Sarsaparilla.

"I took Hood's Sarsaparilla for loss of appetite, dyspepsia, and general languor. It did me a vast amount of good, and I have no hesitancy in recommending it." J. W. WILLEFORD, Quincy, Ill.

Hood's Sarsaparilla

Sold by all druggists. $1; six for $5. Prepared only by C. I. HOOD & CO., Apothecaries, Lowell, Mass.

100 Doses One Dollar

Our 75 cent Colored Silk.

We have had unusual success with this line of Gros Grains.

They are 19 1-2 inches wide, have a fine cord weave, and are in 40 different, excellent shades. Under ordinary circumstances they would sell for $1 per yard.

Send for samples; they will surely please you.

James McCreery & Co.,

Broadway and 11th St., New York.

FREE TO ALL.

Send your address immediately, on postal card, for our 80-page elegantly illustrated Catalogue, describing more than 300 of our Works pertaining to Rural Life.

ORANGE JUDD CO., 751 Broadway, N. Y.

SCHOOL ADVERTISEMENTS.

University of the State of New York.

American Veterinary College.

139 and 141 West 54th St., NEW YORK CITY

15th Annual Session.

The regular course of Lectures commences in Oct. each year. Circular and information can be had on application to Dr. A. LIAUTARD, V. M., Dean of the Faculty.

WESTERN RESERVE UNIVERSITY, CLEVELAND, OHIO.

Over 50 professors and 600 studen's last year.

1. Adelbert College. Classics, Literature, Science. Well equipped, finely located grade of New England Colleges at half the cost.
2. Department of Medicine, three years' course.
3. Conservatory of Music. None better anywhere.
4. School of Art. Elementary and advanced.
5. College for Women. College Home. Grade and cost of Adelbert. Send for Catalogues.

HIRAM C. HAYDN, DD., LL.D., PRES'T.

Steele's School for Young Ladies,

HARTFORD, CONNECTICUT.

Fall Term Begins

Wednesday September 25, '89.

Address GEORGE W. STEELE.

HELLMUTH COLLEGE For YOUNG LADIES London, Ont., Can.

Has Few Equals and No Superior in America.

Highest Culture, Literature, Music, Arts, Elocution, Business Course. Climate exceptionally healthy. Costs moderate. Pupils may enter at any time. For circular, address Rev. E. N. ENGLISH, M. A., Principal.

JUST OUT The Reporter's COMPANION,

By BENN PITMAN and JEROME B. HOWARD. A new presentation of the Reporting Style of Phonography or Phonetic Shorthand. Send for catalogue to PHONOGRAPHIC INSTITUTE, Cincinnati, Ohio.

Best PLACE in America to get a Business Education, learn Spencerian Penmanship or Shorthand is at the Spencerian Business College, Cleveland, O. Founded 1848. 1000 students a year. Elegant catalogue free.

WESLEYAN ACADEMY. One of the half-dozen best Classical and Academic Schools in New England. The payment of $61 in advance will cover ordinary tuition, board, washing, room and heating for the fall term, beginning Aug. 28. Send for catalogue to G. M. STEELE, Principal, Wilbraham, Mass.

Get Clark & Perrin's Home Course of Business Training. All commercial branches taught by mail. Write to Clark's College, Erie, Pa.

$50 for Life Scholarship Situations furnished. PALMS BUSINESS COLLEGE 1709 Chestnut St., Philadelphia, Pa.

HOME STUDY, Book-keeping, Business Forms, Penmanship, Arithmetic, Shorthand, etc., thoroughly taught by MAIL. Circulars free BRYANT & STRATTON'S COLLEGE, 445 Main St., Buffalo, N. Y.

TELEGRAPHY Learn here and earn good pay. Situations furnished. Write Valentine Bros., Janesville, Wis.

PROHIBITION IN KANSAS. By Ex Attorney-General Bradford. Sample copy mailed for 25 cents. THE GEO. W. CRANE PUBLISHING CO., Topeka, Kansas.

ALABAMA If you want to purchase CHOICE LANDS for farming, gardening, fruit-growing or stock-raising, with both rail and water transportation to markets, in the States of Alabama and Mississippi, write to the Alabama Land and Development Company, MOBILE, ALA.

Maps, pamphlets, and full information mailed free. All statements guaranteed absolutely correct. **LANDS.**

FOR SALE—Two fine adjoining farms in Greene Co., Ohio, containing 165 and 190 acres respectively. Convenient to schools, churches and railroads, and surrounded by free turnpikes. Improvements, neighborhood and land first class. Will be sold at a bargain. JOHN M. BROWNE, Room 31 Times B'l'd'g, Chicago, Ill.

AN OPPORTUNITY—Grand fruit farm 120 acres, clay subsoil. All cultivated. Unsurpassed health and advantages. Near station and ocean. Large house. Horses, cows, implements and farm $5,600. Half mortgage. Owner deceased. HOWARD M. DWYER, Lewes, Del.

TO RENT. An orange grove in Dunedin, Florida, for a term of years. Must understand fruit culture and poultry raising. Twelve dollars (12) a month.

S. E. WINSLOW, Rutherford, New Jersey.

A Few Words to the Wise.

E. M. BENEDICT, MASS.

One of the most patronized humbugs, the Louisiana lottery, holds a prominent position, one of the most cruel swindles, as it continually holds out that alluring *ignis fatuus* which mankind will ever pursue, the chance to make a dollar without earning it. Although it is never advertised in any prominent place, still almost every one is well aware of how to procure one of those fancy colored tickets which, in nearly all cases, draw only a blank. It seems as if this disappointment only adds fuel to the flame, for dollar after dollar is sent into the same abyss which has swallowed up so many hard-earned dollars. The writer is well acquainted with many who have followed this illusion and invested many dollars, in some cases up to hundreds, all to no purpose, and it would seem as if human nature would never change. The sooner this business is closed up or drummed out of our country, the sooner will credulous people learn the pleasure derived from money which came not by chance, but by honest industry. Another rampant fraud is a so-called "Portrait Co.," which is booming things in this locality, as almost every country town is well supplied with the plausible circulars containing a promise to make an excellent crayon portrait, free, the only obligation imposed being that of showing the portraits (?) to friends and neighbors. And such portraits! Given plenty of paper, a few crayons, and many a ten-year-old child could turn out better and handsomer work. One oddity of the concern is the fact that Boston victims must send their orders to New York, while New York customers must send to Boston; the result is the same, however.

Another prevalent and money-making class of swindles is made up of the employment agencies that are coming up under all manner of high-sounding names. Many a poor country lad comes to the city to invest his two dollars or his first week's salary to secure a place, which he probably fills for a week, to give it up to some other unfortunate, and so the story goes. The writer can only say, "Be wise as a serpent;" don't place confidence in shams so palpable as some of them are; don't imagine that any one will give you a gold watch for hunting up some Biblical name or verse, for they won't; don't subscribe to any showy paper, as you won't get but a few numbers and then your name will be handed over to some agents' directory, and you'll find too late the mortification and anger caused by the receipt of some questionable books and circulars.

A New Dodge of Swindlers.

The "green goods" swindlers have resorted to a new and most audacious but very transparent dodge for roping-in their credulous victims. It is to inclose with their circulars a pretended letter from a banking-house "indorsing him [the green-goods swindler] as a responsible man, and guaranteeing any transaction you may have with him." It seems scarcely necessary to add that none but a bullhead would bite at such an exposed hook as that. As if a reputable banker would indorse a pretended dealer in counterfeit greenbacks! It gives one a calm sense of retributive justice to reflect that those who are so dishonest as to pay their money, do not get even the counterfeits they expect and pay for. One of the swindlers was foolish enough to send his circulars to L. C. Sachiotte, South Carolina, and C. W. Craig, of Tennessee, both of whom promptly forwarded them to this office for exposure. John A. Reynolds, Kansas, and A. J. Monday, Tennessee, also forward us circulars with a request to show up the swindlers from whom they received them.

Pointers.

The circulars forwarded to us by George Williams, White Co., Ill., emanate, as he suspects, from one of the "Crayon portrait" concerns. It dates from Brooklyn, N. Y., and it bears a strong family resemblance to the others which have been repeatedly shown up in these columns.

Alexander Ray, Putnam Co., Florida: Do not pay "an admission fee of six dollars," or any other sum to an utterly irresponsible "Supply Association," unless you are willing to contribute toward the support of sharpers.

There is no true Muscat grape which is hardy on this side of the Rocky Mountains. The Muscat is a foreign grape, and is extensively cultivated in California, but cannot be grown elsewhere in the United States except under glass. Any one who buys an American grape which proves hardy may be sure it is not a true Muscat, whatever its individual merits may be. Calling a mule a horse does not make a horse of it.

G. W. Langford, Livingston Co., Ill.: We do not advise you to place the sale and control of a patent in the hands of an irresponsible traveling agent, who demands a deposit of five dollars to begin with "for your part of the expense of offering it for sale," and a further commission of ten per cent on all sales. It would probably be the last you would hear of the five dollars or the "agent."

Long Island Field and Garden Notes.

The prospect for a potato crop on Long Island is by no means encouraging; the farmers say they have never seen potatoes come up so poorly, and that the bugs were never before so numerous. Some fields are total failures, and will be planted with cabbage. This change of crop, if too common, will be disastrous to the farmers, as it will make cabbage too cheap. Last year it was not worth shipping, which, in a measure, restricted planting this year. Now, if it has to be a substitute for potatoes, the prospect for the farmer will be poor, indeed.

If any one wants to know how not to prune ornamental shrubs, let him walk through the park at Garden City, L. I., where there is one of the best collections of shrubs to be found in the country, and the worst cared for. They are not pruned, simply maimed for life. In early spring the work commences by cutting off all the graceful growth so that each shrub resembles a miniature haycock—destroying all the wood that produces the flowers, leaving only a few stumps on the Spiræas, Deutzias, Loniceras, Weigelas and Forsythias; shrubs, that if left as Nature formed them, have no equal. It is a downright shame to see such beautiful shrubs left to the mercy of those who have not the slightest conception of the true beauty of a plant, and how to develop it.

A new lettuce, or one so very old as to have become unknown by the active horticulturists of the day, is being worked up as a novelty and will make its appearance in due time. This new comer is variegated, the bright green leaves mottled and spotted with dark brown. The plant has an attractive appearance, but in its esculent properties, we presume, there is no great difference between it and the standard sorts under cultivation.

The Edmands beet is decidedly the best variety for table use in cultivation. In point of earliness, it is next to the Egyptian; in size, it is about the same as the blood turnip, symmetrical and smooth; in flavor it is of the best, except the Bassano, which is the sweetest of all garden beets; in color, it is dark, making it attractive for the table. But its most desirable quality consists in its remaining longer tender and fit for the table.

"FLORAL," Queens Co., N. Y.

Rules for Testing Dairy Cows.

At the last annual meeting of the American Ayrshire Breeders' Association, a committee was appointed to report rules to govern cow tests at all fairs, dairy shows, and experiment stations, that the awards may be given to the breed or single animals which show their superiority as dairy cows. The committee, consisting of James Chessman, Robert M. Carrons and J. D. W. French, have reported the following rules, which are worthy of consideration, not merely for governing public tests of Ayrshire and other dairy breeds, but also for use by dairymen in making private tests of their cows:

First: All cows entered for dairy work should be placed in closed stalls secured by locks. They should be fed and milked by competent persons appointed by the superintendent or judge, subject to the approval of the owner. The food consumed during the test shall be of such kind and quality as the superintendent may determine, subject to approval of owner, and be charged to them at cost price. All water consumed shall be of uniform temperature, and to be carefully weighed and recorded. Unconsumed food shall not be charged against the value of the cow's products.

Second: A statement when the cow dropped her last calf, date of last bull service, method of treatment and feeding since last calving, of kind and quantity of food consumed for ten (10) days previous to commencement of the test, must be made under oath.

Third: The cows shall be milked as frequently as the superintendent may direct, and at regular intervals during the test, and for twenty-four hours previous to its commencement.

Fourth: Scale of points:

For each twenty days since calving	1
For each twenty days of gestation	1
For every pound of dry matter in twenty four hours' milk	8
For every pound of butter in twenty-four hours' milk	30
Total	40

Fifth: Samples of each milking to be taken for analysis; and the total quantity of solids to be determined by calculation.

Sixth: The total quantity of dry butter fat as determined by the milk analysis, shall decide the relative quantities of butter obtained from each cow for twenty-four or forty-eight hours as may be required. When convenient, one or more milkings may be set in a cold, deep setting apparatus of approved make, at a temperature of not less than 90°, and in a cooling medium of 45°; or be separated in a centrifugal machine. The cream product to be ripened in all cases at a temperature of not less than 63° for twenty four hours, and churned at not less than 62° nor more than 67° according to season.

Seventh: The butter obtained shall be analyzed, and only the dry fat be calculated. The mean of the several analyses of milk and butter shall be taken to indicate the quantity of solids and butter fat.

Eighth: The cow, or herd, as the case may be, giving the greatest quantity of marketable products according to the scale, at the least cost, to be awarded the prizes.

Special Premiums for Holstein-Friesians.

A circular signed by Mr. Thomas B. Wales, Jr., secretary of the Holstein-Friesian Association of America, announces the following liberal special premiums:

First. For the Holstein-Friesian cow making the best one-day butter record at any State Fair or at the Expositions to be held at Buffalo, N. Y., Detroit, Mich., Toronto, Can., or at the New England or Bay State Fairs: First premium $100, and Gold Medal of the Holstein-Friesian Association, valued at $50; second premium, $50.

Second. For the Holstein-Friesian cow making the best one-day milk record at any State Fair or at the Expositions to be held at Buffalo, N. Y., Detroit, Mich., Toronto, Can., or at the New England or Bay State Fairs: First premium, $100 and Gold Medal of the Holstein-Friesian Association, valued at $50; second premium, $50.

Third. For the Holstein-Friesian cow winning the first premium for butter in competition open to other breeds at any State Fair, or at the Expositions to be held at Buffalo, N. Y., Detroit, Mich., Toronto, Can., or at the New England or Bay State Fairs, a premium of $50.

Fourth. For the Holstein-Friesian cow winning the first premium for milk in competition open to other breeds at any State Fair, or at the Expositions to be held at Buffalo, N. Y., Detroit, Mich., Toronto, Can., or at the New England or Bay State Fairs, a premium of $50.

Fifth. For the best herd of Holstein-Friesian cattle at the Sate Fair of each of the nine States owning the largest number of Holstein-Friesian cattle, which States are, New York, Illinois, Pennsylvania, Michigan, Ohio, Iowa, Massachusetts, Minnesota, Wisconsin, a premium of $100.

Sixth. For the best herd of Holstein-Friesian cattle exhibited at the State Fair of each of the three States offering the largest herd premiums for Holstein-Friesian cattle, not including the nine States above named, a premium of $100.

Seventh. The Association offers to duplicate any premium awarded to Holstein-Friesian cattle or their products at the Exposition to be held at Buffalo, N. Y.

Eighth. The Association offers to duplicate any premium awarded to Holstein-Friesian cattle at the American fat stock show to be held at Chicago, Ill.

Kind Words.

Every Article Written by a Practical Man.—One admirable feature of the AMERICAN AGRICULTURIST is that every article in each paper is written by a practical man, so unlike the cheap agricultural papers which flood the country.

LYMAN COE, Lawrence Co., New York.

Appreciated Down to the Four-Year-Old.—We all appreciate your journal, even down to the four-year-old. Every member of the family delights in its beautiful illustrations, its valuable advice, and even the advertisements.

J. T. SCHORB, York Co., S. C.

Always a Good Counsellor.—The AMERICAN AGRICULTURIST aids me very much in the management of my rocky New England farm. I have consulted it on a good many points connected with my business, and have always found it a good counsellor.

J. C. KENDALL, Middlesex Co., Mass.

It Never Disappoints.—I am not a farmer, but have read the AMERICAN AGRICULTURIST for a great many years, and have never been disappointed in one number. Whatever a man's occupation may be, he can get his money back several times out of a year's subscription to this excellent periodical.

J. A. E. CARPENTER, Lancaster Co., Pa.

The Farmer's Duty.

What do our readers want the experiment stations to do? If they will make their wants known in brief communications to the AMERICAN AGRICULTURIST, we are sure they will be given respectful consideration. One great trouble with farmers is that they will grumble at home about the colleges or the experiment stations, but will not even venture to make known to these institutions the reasons for their criticism, nor even suggest the work they want done. The practical every-day working farmer knows many matters connected with his business about which more information would enable him to increase his profits. Many of these matters are right in the line of experimental work. Others, of course, would be entirely out of the station's province. But that is no reason why they should not be made known.

A very successful practical farmer writes that he would like to have the stations ascertain what is lost by evaporation when stable manure is applied to the surface of the land, and if this loss is saved when the manure is harrowed or plowed in. We appreciate also the feelings of quite a number of our best farmers in demanding that the whole question of the application of manures and fertilizers receive careful investigation. So important do we regard this particular suggestion that in the book for the reports in the AMERICAN AGRICULTURIST Prize Crop Competition we have called for as full information as possible about the application of the manures and fertilizers employed. This is certain to bring out many points of great interest. Then there are practical questions, such as the eradication of brush and brakes, hardhack, foul weeds, etc., that come home very strongly to every farmer, and while it might appear at first sight quite impracticable for the stations to give much help in this direction, it is in just such fields that their workers should exercise their originality and ingenuity. The stations should not be afraid of striking out into new fields. They must not confine themselves to simple plat tests and laboratory analyses. There is a natural tendency on the part of some of our scientific workers to imitate rather than originate. While it is essential that there be more or less repetition, especially in the newer States, and much educational rather than original work is still to be done by the stations, each and all should endeavor to accomplish some original results in practical as well as in purely scientific matters.

A Montana Creamery.

About six miles from Helena, in Montana, is a model ranch, the finest, I think, in the Territory. Mr. W. C. Child, the owner of the place, has 4,000 acres of land in an angle between two streams in such a way as to control the range in three directions. He raises hay, oats and other crops, and in his pastures and on the range five breeds of cattle and horses roam about. A barn which would do credit to any country, and is probably the finest in this Territory, has quarters for nearly 400 cattle, besides immense lofts for hay and grain. The ranch with all its improvements has cost $175,000, and still improvements are being made, the present owner having been in possession of it only two years. Among the stock is a great grandson of the famous thoroughbred horse Lexington; and all the mares are blooded animals. The creamery is, however, what most attracted me. It has a series of ingenious contrivances for the reduction of manual labor. The water from the irrigating canal is turned into a turbine wheel of fifty-horse power, and by means of this the cream is separated in a centrifugal separator, the butter churned, grain ground and hay chopped for the stock, wood sawed and several other duties performed.

A complicated system of water works extends all over the houses. Artesian water at a temperature of forty-four degrees is conducted everywhere, and hot water and steam are also supplied. The skimmed milk is poured into a funnel, and flows through a tube several hundred feet to the piggery, where the only thing needed to complete the arrangement is to educate one of the pigs to turn the stop-cock when milk is wanted. The same tube which carries the milk can be made to carry cold water, warm water and steam, and connected with the slaughter-house when necessary. Here is as fine a creamery as will be found in any part of the county for its size, admirably fitted and with good prospects of success.

R. S. TARR, Lewis and Clark Co., Montana.

Rheumatism,

BEING due to the presence of uric acid in the blood, is most effectually cured by the use of **Ayer's Sarsaparilla.** Be sure you get Ayer's and no other, and take it till the poisonous acid is thoroughly expelled from the system. We challenge attention to this testimony:—

"About two years ago, after suffering for nearly two years from rheumatic gout, being able to walk only with great discomfort, and having tried various remedies, including mineral waters, without relief, I saw by an advertisement in a Chicago paper that a man had been relieved of this distressing complaint, after long suffering, by taking Ayer's Sarsaparilla. I then decided to make a trial of this medicine, and took it regularly for eight months, and am pleased to state that it has effected a complete cure. I have since had no return of the disease."—Mrs. R. Irving Dodge, 110 West 125th st., New York.

"One year ago I was taken ill with inflammatory rheumatism, being confined to my house six months. I came out of the sickness very much debilitated, with no appetite, and my system disordered in every way. I commenced using Ayer's Sarsaparilla and began to improve at once, gaining in strength and soon recovering my usual health. I cannot say too much in praise of this well-known medicine."—Mrs. L. A. Stark, Nashua, N. H.

Ayer's Sarsaparilla,

PREPARED BY

Dr. J. C. Ayer & Co., Lowell, Mass.

Price $1; six bottles, $5. Worth $5 a bottle.

MARK YOUR TOOLS WITH A STEEL STAMP OR BURNING BRAND. PRICE LIST FREE. J.B. RONEY, LYNN, MASS.

Shady Hill Nurseries, Cambridge, Mass.

One Hundred Orders a Day

Is common in our sales of our

BEAUTIFUL NEW TREES.

All our old customers will tell you **who has the very newest** and the most genuinely valuable hardy trees and shrubs for ornament. Every new hardy tree or plant that comes to sight, from any part of the world, is, at once, secured and propagated at our nurseries. If our good friends and patrons who love plants, could only go carefully through our propagating houses, and see the wonderful processes of multiplying the delightful things that have made "Shady Hill Nurseries" famous among plant lovers everywhere, they would remember it, as hundreds do, with enthusiasm.

Send 2 stamps for our two grand illustrated catalogues (see notice in this paper, page 203,) and have a feast!

TEMPLE & BEARD.

POT GROWN STRAWBERRIES

We will have our usual fine supply ready about July 15th. Catalogue containing correct descriptions of the best **Old** and **New** varieties, with cultural directions, mailed *free*.

ELLWANGER & BARRY, MOUNT HOPE NURSERIES, **ROCHESTER, N.Y.**

STRAWBERRY HULLER. By mail, 10 cents each; 3 for 25 cts.
A. S. BUNKER, Lawrence, Mass.

CABBAGE PLANTS. The best varieties well packed by express in *any quantity* at $1.50 per thousand. Also Celery Plants after July 1st. $2.50 per 1000. Circula's free.
ISAAC F. TILLINGHAST, La Plume, Pa.

A CHANCE TO MAKE MONEY. **Salary and Expenses paid,** or Commission if preferred. Salesmen wanted everywhere. No experience needed. Address, staring age,
H. W. Foster & Co., Nurserymen, Box M, Geneva, N.Y.

WHEAT FERTILIZER **$20 PER TON.** Sold to Farmers direct from our works. No agents. **YORK CHEMICAL WORKS,** York, Pa.

ROAD CARTS A **$40** Cart for **$15.** Catalogue free.
Chicago Scale Co., Chicago, Ill.

THE SUPERIOR FENCE MACHINE.—Positively the best and cheapest made. Price **$6.50.** Agents wanted everywhere. Territory free. Address at once
THE SUPERIOR M'F'G CO., Martinsville, O.

ORGANS. Special inducements. I want some one to act as agent in every town.
GEO. HASBROUCK, Paterson, N. J.

The Earth on Wheels!

WITH A DOWN HILL PULL!

Royal Presents for Everybody!

THE AMERICAN

FARM NEWS

Offers the Grandest PREMIUMS Ever Heard Of.

The subscription price to this Great Farm and Home Journal is only 25 cents per year.

EVERY person sending in **one yearly subscriber** will get the paper free for one year. Every subscriber paying 25 cents for a year's subscription has a chance to guess on the number of letter O's which will appear on the 8th page of the subsequent issue. The correct guesser or the one guessing nearest the right number will receive an elegant gold watch. The next best guesser gets a silverine watch. A getter up of a club of two will receive a package of eight bottles of elegant perfume. 30 cents gets a copy of the paper for a year and ten books. Fine Fishing Tackle with every two subscribers. Ideal Hair Curler free with every club of three. Gold Watches, Buckeye Mowers, Music Boxes, etc., given away. Send 25 cents for a year's subscription and get chance to guess, or 2 cents in stamps for sample copy and premium list. Address

AMERICAN FARM NEWS, Akron, O.

[We know the above firm to be reliable and they will make good every offer made.—EDITOR.]

To Help the Farmers.

How the Stations are Equipped for Business.

KENTUCKY—The station is a department of the Agricultural College at Lexington, and is managed by an executive committee of the trustees, including the president and director. The station staff is not completed, as the college does not contain the experts in all the lines it is proposed to study, there being a director, chemist and three assistants. The director is professor of agriculture in the college and gives one hour a day to instruction, half of his salary being paid by the college. Thus far practical work has been undertaken especially in testing soils and fertilizers to ascertain the cheapest fertilizers to produce the largest crops. Forty-eight acres near the college have been purchased, and twenty acres laid out in plats of one-tenth of an acre, on which have been forty-two plats of corn and a large number with tobacco and hemp in duplicate and triplicate. Grasses and forage plants are largely grown. A three-story building for the station costing, with its equipments, $15,500, of which only $3,000 for construction was paid from the Hatch fund, contains the offices, libraries and laboratories of the chemist, microscopist, veterinarian, horticulturist and botanist.

MAINE—The station in connection with the agricultural college at Orono has the use of the new natural history and agricultural building, costing $25,000, but it also has a separate building of its own, costing $7,000. No land has been transferred to the station, but it has the use of so much of the college farm as it wants, the rest of the farm being run by the professor of agriculture. The station council consists of the president, director, and professors of agriculture, natural history, veterinary science, botany and entomologist, and a horticulturist and meteorologist are to be secured. A small part of some of the salaries are paid from the station fund. The director and his two assistants are wholly paid from the station, and so is the veterinarian. The work is specially adapted to farmers' wants in the matter of fertility and stock feeding, and extensive inquiries into bacteria and veterinary subjects are planned.

MISSOURI—Concentration on a few things upon which Missouri farmers want light is the rule at Columbia. The State University has given the station the use of $100,000 of buildings and real estate fully equipped. The director, chemist, horticulturist and veterinarian give from one to two hours per day to instruction and draw half their salaries from the college, but it pays the whole cost of the superintendent of the college farm proper. Some three hundred field, feeding, stock and chemical investigations are under way or have been completed.

MISSISSIPPI—The heads of the divisions of station work are professors in the Agricultural College at Starkville, each of whom are given assistants wholly paid by the station and wholly working for it; in no case do these professors get over twenty-five per cent of their salaries from the station. Barns, sheds and the land needed have been given the station by the college to be returned when no longer wanted. An effort has been made to employ student labor (Senior class). No branch stations are yet established, but local work is done when plant diseases or insect pests are only local.

MARYLAND—Believing it practically impossible for a professor to do the best work as an experimenter if he has to teach, the workers here are wholly independent of the agricultural college, and the financial accounts are wholly separate. The station uses what land it wants and then gives it up to the college. A building has been prepared for its special use, containing the station, laboratory, offices, etc. Students are permitted to get the benefit of the station work under the tutelage of instructors and student labor is employed on irregular work. A committee of visitors from the State Grange is doing much to popularize the station, and so are the station's exhibits at county fairs, these exhibits being shown up by members of the Senior class. Market gardening, forage plants, wheat and small fruits, have received attention thus far, the object being to make the station "solid" with the farmers. Tobacco, live stock, feeding, crop rotation, and more scientific work is to be undertaken.

MICHIGAN.—The college and station are practically one, though the finances are kept wholly separate. The professors of botany, chemistry, entomology, horticulture and veterinary science work for the station and get one-third of their salaries from it, and so does the president, who is director, their assistants in the station work being paid wholly from its treasury. Experimental work heretofore conducted by the college is now done in the name of the station. One branch station with four sub-farms have been established among the pine barrens to find out how they can be profitably utilized; $1,000 worth of books have been bought. Stock feeding for beef and now dairying, also a large variety of crops, the warming of water for stock, testing and propagating fruits, the diseases of plants, very extensive work with grasses and forage plants, are among the principal things under way.

MASSACHUSETTS.—The Hatch experiment station of the Agricultural College at Amherst is independent of the State Station, but the latter is given $5,000 of the Hatch fund for chemical and such other work as it may do for the Hatch station, whose work is supervised by a committee of eight trustees, including the master of the State Grange and the Secretaries of the State Horticultural Society and of the Board of Agriculture. The professors of agriculture, horticulture, entomology and meteorology, are at the heads of these departments in the station, but their regular salaries are wholly paid from the college as heretofore, and the station pays them only for the actual work they do for it. The equipment in these departments is very complete, but the work thus far has been particularly in horticulture and entomology.

Garden and Farm Topics.

Embraces a Series of Essays giving Special Information on the Subjects named. With a Steel Portrait of the Author.

By PETER HENDERSON.

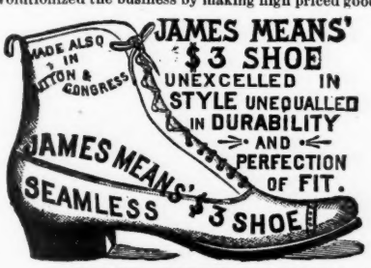
CLOTH, 12mo. PRICE, POST-PAID, $1.50.

ORANGE JUDD CO.,

751 Broadway, New York.

JAMES MEANS & CO.'S BOOTS AND SHOES.

The best testimonial we ever had.—"James Means & Co. are the bears of the boot and shoe market. They have revolutionized the business by making high priced goods unsalable."—*Trade Paper.*


MADE ALSO IN BUTTON & CONGRESS
JAMES MEANS' $3 SHOE
UNEXCELLED IN STYLE UNEQUALLED IN DURABILITY AND PERFECTION OF FIT.
JAMES MEANS' $3 SHOE
SEAMLESS

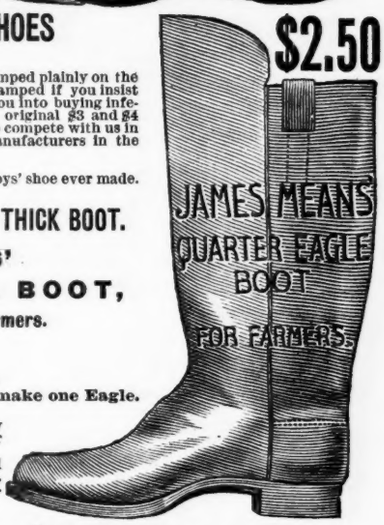
JAMES MEANS' BOOTS AND SHOES

Are Unexcelled in Merit.

Positively none genuine unless having our name and price stamped plainly on the soles. Your retailer will supply you with Boots and shoes so stamped if you insist upon his doing so; if you do not insist, some retailers will coax you into buying inferior goods upon which they make a larger profit. Ours are the original $3 and $4 Shoes, and those who imitate our system of business are unable to compete with us in quality of factory products. In our lines we are the largest manufacturers in the United States.

How your boy does wear out his shoes!

James Means' $2 Shoes for Boys will outwear any other boys' shoe ever made. You can have Lace or Button.



$2.50 BUYS THE BEST FARMERS' THICK BOOT.

JAMES MEANS'

QUARTER EAGLE BOOT,

A Reliable Kip Boot for Farmers.

10 Mills make one Cent;
10 Cents make one Dime;
10 Dimes make one Dollar;
10 Dollars make one Eagle.

And with a Quarter Eagle any Farmer in the Country can now buy a boot that will satisfy him. Farmers have been looking for such a boot for a long time and now it has come.

Boots and Shoes from our celebrated factory are sold by the wide-awake retailers in all parts of the country. We will place them easily within your reach in any State or Territory if you will invest one cent in a postal card and write to us.

Special Offer on the James Means Quarter Eagle Kip Boots for Farmers.

In order to immediately distribute samples of these boots all over the country, we will send them, transportation prepaid, to any man in any place where there is a postoffice or railroad in any State or Territory of the United States. We will send them by express or by mail, with all charges for transportation to destination prepaid by ourselves, on receipt of regular price, $2.50. Send money by postoffice order or registered letter. We will accept United States postage stamps for the odd half dollar.

In order to get a perfect fit, take a piece of paper and place your foot upon it, then mark out the shape of your foot, keeping your pencil close to the foot all the way round. Then take the last boot which you wore, and mark out the shape of that in the same way. We will fill your order on the same day we receive it. Take great care to be very accurate, and be sure to give us your full address, town, county, and State or Territory. If we have a dealer handling our goods in your town we want you to buy of him, we do **not** want you to send to us as we will not interfere with the dealers who sell our goods, but we are glad to supply you if your dealer will not. Any boot and shoe retailer or any country storekeeper can supply you with our goods if he wants to, but some dealers will try to sell you inferior goods on which they make a larger profit than they ought to ask for. In that case, send to us.

JAMES MEANS & CO., 41 Lincoln Street, Boston, Mass.

EDWARD EGGLESTON'S NOVELS.

Uniformly Bound in one Set.

FIVE VOLUMES.

The chief critical authorities have awarded to Dr. Edward Eggleston a very high place as a writer of genuine American fiction, and the immense sale of his works is the best evidence of their popularity. A new edition of these works is now issued, designed to meet an often expressed wish that they could be obtained in uniform style, in sets. They are bound attractively and uniformly, in five volumes, as follows:

THE HOOSIER SCHOOLMASTER. Finely illustrated, with twelve full-page engravings, and numerous other cuts. Price $1.25.

THE END OF THE WORLD. WITH thirty-two illustrations. Price $1.50.

THE MYSTERY OF METROPOLISVILLE. Finely Illustrated. Price $1.50.

ROXY. A TALE OF INDIANA LIFE. HANDsomely illustrated. Price $1.50.

THE CIRCUIT RIDER. A TALE. HANDsomely illustrated. Price $1.50.

Price of the Set, Complete, $7.25.

ORANGE JUDD CO.,

571 Broadway New York.

JUST PUBLISHED.

New, Revised and Enlarged Edition of

THE PIONEER AMERICAN SWINE BOOK,

HARRIS ON THE PIG.

BREEDING, REARING, MANAGEMENT, and IMPROVEMENT.

By JOSEPH HARRIS,

Author of "Gardening for Young and Old," "Talks on Manures," etc.

MORETON FARM, ROCHESTER, N. Y.

ILLUSTRATED.

With new preface specially interesting to all agricultural readers, and two new chapters giving the author's views of **"Pig Feeding and Breeding"** at the present time. He seems to differ from many of the recent theories and argues the matter with his accustomed clearness and force. He appears to think that there is little truth in the notion in regard to **"Feeding for Fat and Lean."** Full details are given of all the important experiments that have been made in fattening hogs, amount of food consumed, gain, etc. And it is claimed that many of these experiments are defective and ought to be repeated. The book is one that no intelligent farmer should fail to read.

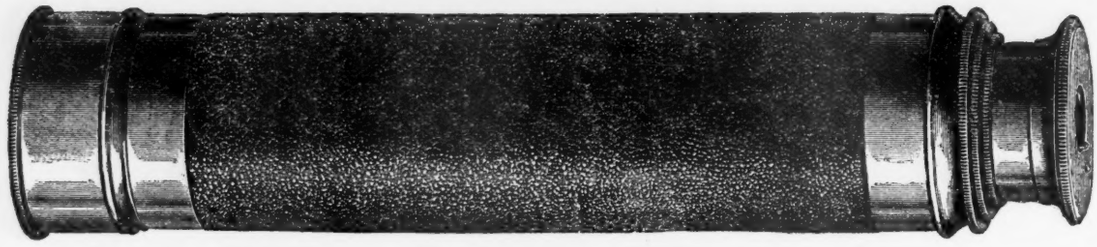
CLOTH, 12mo. PRICE, POST-PAID, $1.50.

ORANGE JUDD CO.,

751 Broadway, New York.

AMERICAN AGRICULTURIST

FRENCH ACHROMATIC TELESCOPE.



FULL SIZE OF TELESCOPE CLOSED.

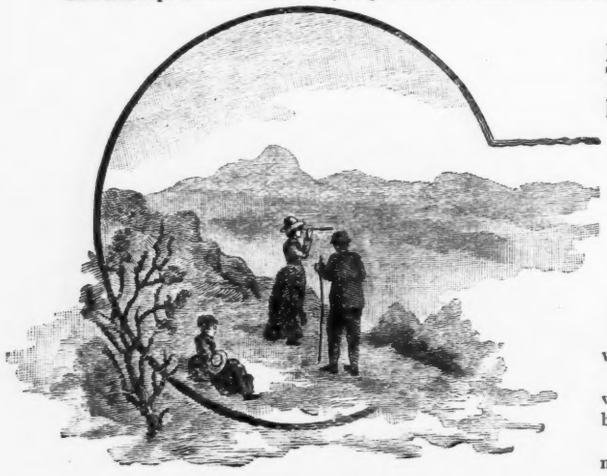
FOR ONLY $3.00 we will send one of these telescopes postpaid to any post office in the United States and in addition will include with each instrument

A YEAR'S SUBSCRIPTION FREE TO THE AMERICAN AGRICULTURIST.

The telescope and subscription sent to separate addressed if desired.

A FIRST CLASS INSTRUMENT.

This telescope is first class in every respect and our subscribers testify that it is equal to other instruments that cost from $5.00 to $15 each.



High power achromatic telescopes have heretofore sold at prices placing them almost beyond the reach of persons of moderate means. The telescope we now offer is just what the people want, **a real philosophical instrument, at a low price.**

FARMERS, HERDSMEN, HUNTERS, PROSPECTORS, SAILORS, TRAVELERS, TOURISTS, AND, IN FACT, EVERYBODY, WILL FIND THIS INSTRUMENT INVALUABLE.

Farmers and herdsmen can see their **cattle or sheep miles away.**

Hunters can distinguish **game at great distances,** and by this means not give warning of their approach.

The tourist can bring distant mountains, valleys and cities almost to his feet, while anyone with this telescope will soon become familiar with different objects that before (from their great distance) he knew nothing of.

Friends and acquaintances can be recognized at great distances, and the instrument will prove both instructive and amusing to everyone.

DESCRIPTION OF THE TELESCOPE.

DIMENSIONS:—The length of the telescope, when extended, is 16½ inches; when closed, 6 inches; diameter, 1¾ inches.

FIVE LENSES. This useful and beautiful instrument has **five lenses,** of the **best French manufacture. The object lenses are achromatic,** that is, **convex** and **concave,** having different retractive and dispersive powers, with the curvatures so adjusted that the chromatic aberration produced by the one is corrected by the other, and light emerges from the compound lens undecomposed, or free from color, **objects at a long distance** appearing clear and natural.

BRASS SLIDES. **The slides and mountings** are made of brass highly polished, the telescoping tubes fitting closely into each other.

BRASS SAFETY CAPS. **Safety caps** of **polished brass** cover the **exposed ends** of the instrument, **keeping out dampness** and **dust** when not in use.

MOROCCO COVERED TUBES. The main tube or body of the telescope is covered with handsome French morocco, making it altogether a most excellent instrument.

Each Telescope is furnished in a strong cloth covered case. It is strongly made and cannot get out of order, but will last for a lifetime.

HOW FAR YOU CAN SEE WITH IT.

If the atmosphere is clear you can see **the time on a tower clock at a distance of five miles. A man** who is **one mile away** will appear to be **fifteen rods** from you, and **persons** with whom you are familiar **can be recognized** at a distance of **three or four miles. The moons of Jupiter can be seen with it.** What are supposed to be **mountains** or **extinct craters** on the **surface of the moon** can be **seen plainly** with the glass.

There is not a man, woman or child that cannot find uses for such a glass almost every day of their life. **Many of our customers write** us that they have **never had so much pleasure and enjoyment** from a small investment as **this telescope has afforded them.**

(See Next Page.)

What Our Subscribers Say of This Telescope.

Equal to a $15 Instrument.

Some time ago I received my French Achromatic Telescope by mail in good order, and feel **well pleased** with it. I think it fills the recommendation of your advertisement. **I have compared it with a field glass costing $15** and with **another Telescope** of English manufacture of 3 inches more length **costing $7.00, and consider the power of yours fully equal to either of the higher priced glasses.**—[George H. Northrop, Naugatuck, Ct.

Worth Four Times its Cost.

The French Achromatic Telescope ordered of you some time since is indeed a **superb instrument.** I have frequently observed the **nail-heads in a barn wall at a distance of half a mile. Four times its cost would not induce me to part with it.**—[Marquis P. Truax, Almo, Ind.

Sees Objects 40 Miles.

The French Achromatic Telescope is **fully as represented in every particular** and exactly the same in all respects if not **better than the ten-dollar Telescopes** for sale in our **city stores.** I use it in my school and **my pupils see objects 40 miles off** quite distinctly as if right before us. **Can tell persons three miles off** and tell which direction **the vanes on barns and houses stand for 6 or 7 miles.**—[Erb Steiner, Spring Mount, Pa.

Wouldn't Take $5.00 for it.

Telescope received to-day. There are so many cheap imitations that I was reluctant about placing my order with you. But **I am well pleased with it** and it is **all you represent it to be. I would not take $5.00 for it.**—[M. W. Knight, Kingsdown, Kans.

Sees 30 Miles.

The French Achromatic Telescope I received of you gives **good satisfaction. Rocks, trees and bushes** are **distinctly seen** at the **top of Smoky Mountain** from our residence, **30 miles distant.**—[M. F. Johnson, Maryville, Tenn.

Combines the Field Glass and Telescope.

Of the Achromatic Telescope that I recently purchased of you I am free to say that I do not know how in the world such an instrument can be made and furnished at so low a figure. **From my piazza** on the West bank of the Hudson, **I can see** through this instrument **vessels sailing by Poughkeepsie seven miles off** and could see much further out for the bend in the river. Can read the banners of all the boats passing up and down the river and distinguish passengers. It seems to **combine the qualities** of the **field glass** and of **the telescope.** I have tried it on the moon and discovered that she is more "looney" (Luna) than ever. "The man in the moon" is plainly apparent and so are some of the craters. The instrument brings the stars near enough to see a gyrating motion; astronomers can tell better than I whether it be their orbit or revolution—certainly this can only be the effects of immense magnifying power.—[L. R. Dickinson, Rector Ascension Church, West Park, N. Y.

Sees Objects 12 Miles.

The telescope **answers my expectations fully. I can see objects 10 or 12 miles away very plain** when it is clear, and the Moon looks a great deal plainer through it than it does to the naked eye. I don't see how you can afford to give so much for the amount of money you receive. Other concerns offer telescopes which they claim are larger for less money, but it don't seem to me that they could be reliable; they must be cheaply and poorly made.—[Willis A. Warren, Abington, Ct.

Just as Represented.

The French Achromatic Telescope **ordered,** you sent me very promptly. **I find it to be as you represented in every detail.** It gives me much pleasure in looking off at long distance. **Objects one mile away** look to be almost **within reach. I would not part** with it for a **five dollar note.** Anyone wishing for a glass of this kind, will find it to be a prize. My experience is, when the AGRICULTURIST advertises **anything** it can be relied upon, as being as represented.—[W. H. Fifield, Chicopee, Mass.

Never Expected Such a Glass.

I have received the telescope in good order and **am well satisfied with it; it far exceeds my expectations.** I cannot tell how far I can see, as we live too much among the hills to give it full range, but **I never expected to receive such a glass for the price.** I got one advertised in another paper some years ago—it is much longer but no good; it is made of paper and looks like morocco and is a humbug. **I would not take three times for the one I got of you what I paid for it** if I could not get another like it. Anyone wanting a glass of this kind need not fear to invest in your offer.—[George A. Hoppen, Fishers Ferry, a.

Better Than a $11 Instrument.

The French Achromatic Telescope I ordered of you is received and is **just as good as represented. I compared it with one much larger that cost $11 and could see better with mine.** While it is a first class instrument it can be closed up and carried in your pocket without the least inconvenience.—[P. H. Sumner, M. D., Camptown, Pa.

Surprised at the Quality.

The Telescope ordered of you came to hand in due time and **I am quite surprised at the quality of it,** expecting nothing but a "cheap John" affair at the price paid, instead of which I have **an article of real merit** and I think **fully equal to three or five times its cost.**—[Geo. O. Guild, Bellow Falls, Vt.

Beautiful, Entertaining, Serviceable.

I received the Telescope O. K. and am well pleased. It speaks for itself, and when one of my comrades doubts its power, all I have to do to convince him is to hand him the glass. **It is a beautiful, entertaining** and above all **a serviceable instrument** that anyone would be proud to own. —[Chas T. Shaffer, David Island, New York.

All We Claimed for It.

I received the telescope by mail in good order. **Am more than pleased** with it and have **enjoyed myself** in using it while traveling through the country **more than double its cost.** I find it **better than I expected** and **all you claim for it.** I have let others try it and they **all pronounce it a very clear distinct glass, as good** as they **ever saw** for its size.—[Geo. B. Harris, Centreville, R. I.

Expectations Fully Realized.

It is **with pleasure** that I embrace this opportunity of testifying to **the merits** of the **French Achromatic Telescope** sent me by the "AMERICAN AGRICULTURIST." **I am much pleased with it** and I have **realized fully the expectations** which I derived from reading your advertisement respecting it.—[Geo. F. Beale, Cola, Pa,

Better Than Expected.

I received the Telescope all O. K. and find it to be **just what you advertised it** to be and **better than I expected to get.** I have compared it with one I paid $5 for and think it is **equally as good as the $5 Telescope.** —[Edgar Sweet, Kingston, R. I.

Just Splendid.

The telescope I received as a premium with your Magazine is **just splendid—superior to what I expected to get,** and is giving me and my friends **much pleasure,** for which accept thanks. [L. A. Kennard, Boston, Mass.

Disappointed—Agreeably.

The French Achromatic Telescope came promptly to hand in answer to my order, and I have this to say in regard to it, viz: That in **two particulars I am disappointed.** First, **it surpasses my expectations.** Second, **I find it just as you advertised.**—[H. A. Smith, So. New Berlin, N. Y.

More than Satisfied.

When I first saw your advertisement of a Telescope for the small sum of $1.50 in connection with $1.50 for the AMERICAN AGRICULTURIST I felt half suspicious that the instrument could not be so powerful as represented. But I said to myself, "I never knew that firm to misrepresent any article they advertised and I will try one." I did so, and **after several weeks' trial am more than satisfied.** Last Sunday I went upon one of the neighboring hills to take a look at the flood, and with that Telescope I **could see what was going on miles away, read the names of steamers passing up the river,** and the **signs in the city,** etc. I am at a loss to know how so good an instrument can be offered for so little money.—[Alpheus Darrison, Anacostia, D. C.

How You Can Secure One.

On receipt of $3 we will send one of these Telescopes put up in a neat case, by mail postpaid to any postoffice in the United States, and in addition will include

A Year's Subscription Free to the American Agriculturist.

The subscription and instrument sent to separate addresses if desired.

How You Can Get This Telescope for $1.50.

Induce some friend or neighbor to hand you his subscription to the AMERICAN AGRICULTURIST ($1.50), to which add $1.50 and we will send him a year's numbers and the telescope to you.

TO CANVASSERS: For $6 we will send six yearly subscriptions to the AMERICAN AGRICULTURIST and the Telescope to the sender of the club.

If you cannot procure six subscribers, send four subscribers at $1 each and add $1 in money ($5 in all) and we will send the Telescope postpaid. Subscribers taking any of our book offers count the same as for the AMERICAN AGRICULTURIST only.

SPECIAL 60 DAYS OFFER RENEWED.

We want to introduce one of these Telescopes into every home where this magazine is read, and as an inducement to order immediately we will continue to send with every Telescope ordered previous to September 1, 1889, a

London Pocket Microscope FREE.

See Full Description in May Issue.

Address all orders to

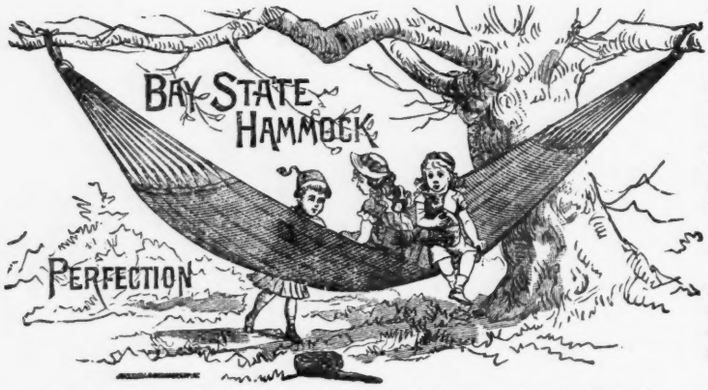
The American Agriculturist, 751 Broadway, New York.

TO TAKE SOLID COMFORT

—— GET A ——

BAY STATE HAMMOCK. $1.20, POSTPAID.

This Hammock and the American Agriculturist One Year only $2.00, post-paid.



The Best, Strongest and Most Beautiful Hammock in the World.

The peculiar value of these Hammocks lies in the fact that **the body is woven,** not knit, as in the ordinary hammock, and **does not pull buttons from the clothing. It conforms itself to every motion of the body,** has the **elasticity** of the **best spring bed,** and is made **strong** and **beautiful. It overcomes all the objections** to the netted and Mexican Hammock, and is indeed a **decided luxury.** These Hammocks have the patent iron ends, presenting a straight side to the body of the Hammock so that the **ends** are **flat** and **smooth** instead of being rolled up, as is the case with a round ring, or the Mexican Hammock. They are admitted by all to be the **strongest** and **most durable Hammock in the World** as well as the most beautiful. For young children they are much **more comfortable** and **cool than cradles** or **beds.**

We will send a **No. 4 Hammock,** the size usually desired, for **$1.20 by mail, post-paid,** or with the AMERICAN AGRICULTURIST one year for only $2.00, post-paid. **The No. 4 is 11 feet in length and 3 feet wide,** and will easily sustain a weight of 300 to 400 lbs, and is the same Hammock that many storekeepers sell for $1.50 and $2.00.

For $3.00 we will send three yearly subscriptions to the AMERICAN AGRICULTURIST and one of these No. 4 Hammocks to the sender of the club, post-paid.

LARGER SIZES AS FOLLOWS:

No. 2. 12 feet long and 4 feet wide, by mail post-paid, $2, or with a year's subscription to the AMERICAN AGRICULTURIST, $2.75.

For $5 we will send five yearly subscriptions to the AMERICAN AGRICULTURIST and one of these No. 2 Hammocks to the sender of the club, post-paid.

No. 1. 13 feet long and 4 1-2 feet wide, by mail, post-paid, $2.25, or with a year's subscription to the AMERICAN AGRICULTURIST for only $3.00.

For $6 we will send six yearly subscriptions to the AMERICAN AGRICULTURIST and one of these No. 1 Hammocks to the sender of the club, post-paid.

Any one receiving one of these Hammocks and not finding it just as advertised can have the purchase price refunded. We guarantee satisfaction to every customer.

What Our Customers Report:

"The Hammock bought of you last summer has **given good satisfaction.** I thought it very good for the price."—[Henry S. Butler, Blairstown, N. J.

"I am **entirely satisfied** with the Hammock you sent me. It met my expectations fully."—[William Watkins, West Gratton, W. Va.

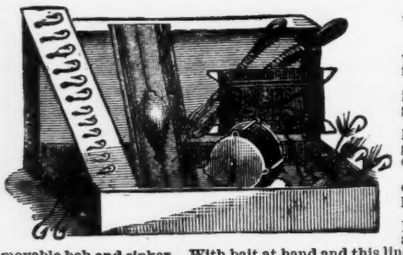
"The Hammock you sent me is **perfectly satisfactory in every way.** It fully meets my expectations and I find it **just as you advertised it to be.** It was **used all summer,** and is now ap arently as **good as ever.**"—[Mary R. Flint, Winchester, N. H.

"The Hammock was all I expected. **Very good, substantial,** and **worth all it cost.** I consider it **a bargain.**"—[O. P. Jones, Philipsburg, Pa.

"The Hammock we received from you was in **constant use last season,** and was **satisfactory in every respect.**"—[A. Howe, Hampton, Va.

THE FISHERMAN'S OUTFIT.

A COMPLETE ANGLING OUTFIT FOR ONLY 50 CENTS!



No fisherman can afford to pass this offer by, because no where can he get such an outfit for double or more money.

Read the descriptions carefully.

No. 1. One Fine Metal Reel—This is a perfect reel, works well, and when attached to the pole will wind any line in first class style.

No. 2. One Linen Trout Line—Strictly first class, made in the most perfect manner and the strongest trout line made, guaranteed to safely land the heaviest trout or fish of equal size.

No. 3. One Linen Bass or Salmon Line—Of the same high standard but larger, adapted for big fish like salmon or gamey fish, like black bass. This line will land the biggest fish caught with bait and sinker, or trolling from boat.

No. 4. One Long Cotton Line—Dark colored, nicely cross wound on a block, and good for every day fishing after perch, catfish, sun fish, rock bass, etc.

No. 5. One Line Furnished Complete with Hook, Bob and Sinker—This is a whole outfit in itself, comprising a long and strong line with medium size hook attached and neat movable bob and sinker. With bait at hand and this line in his pocket the fisherman can start right in and try his luck.

No. 6. One Dozen Best Steel Ringed Fish Hooks (assorted sizes)—These are the best grade of hooks, warranted strong, sharp in points and barbs, and handy to use, anybody being able to tie their line into the ring of the hook. With this set of hooks the fisherman can try his luck for any size from minnows to weak fish.

No. 7. Two Imported Trout Flies—These are the new improved style of fly. They will draw trout from deep pools when the other flies fail. They are natural, brilliant in colors, strongly fastened around the hooks, and will give excellent satisfaction

No. 8. One Improved Bass Fly—This is the best approved fly for black bass fishing, and is the equal of the trout flies in excellence of material and artistic position.

No. 9. One Improved Salmon Fly—Also accompanies the outfit, and is of the best pattern and perfect shape and color, sure to raise and catch the fish.

No. 10. Two Snell Hooks and Gut—These hooks are set on long guts, and where fish cut the lines, one of these snell hooks can be safely used; the gut cannot be severed and lands the fish every time.

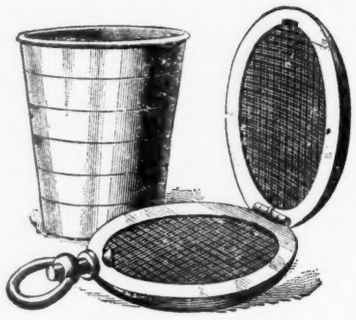
Here then is a complete Fisherman's outfit at the nominal price of half a dollar. No excuse now, the poorest boy or man can afford this complete assortment, and ought to keep his family in fish the year round, or catch enough to sell. As much sport can be had with this outfit as with a ten-dollar one, and the quality of everything is as represented.

Price of the complete outfit, only **50 cents.** Sent by mail postpaid.

FOR $1.60 we will send this outfit postpaid, together with a year's subscription to the AMERICAN AGRICULTURIST.

The Outfit and subscription sent to separate addresses if desired.

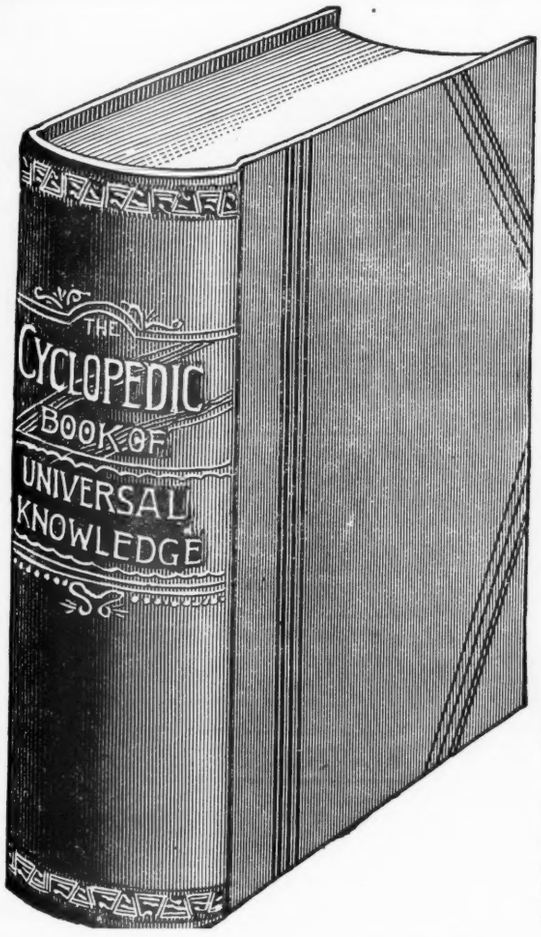
Pocket Drinking Cup.



This collapsing cup, as it is called, is a very convenient article to own, and a decided novelty. It occupies no more space than a medium sized watch, so that it can be carried constantly without inconvenience. In their journeyings people often come across sweet springs of water which they long to taste, but generally are not able, as no cup is to be had. This cup is always handy. Its use in the cars, at picnics and the like, is invaluable. It is made of nickel and inclosed in a handsome watch-case, which can be attached to the chain if desired, and no one could tell the difference between it and a real watch until opened.

Price 25 cents, postpaid.

Address all orders to THE AMERICAN AGRICULTURIST, 751 Broadway, New York.



A $2 SUBSCRIPTION BOOK SENT FREE!

THE CYCLOPEDIC BOOK

OF UNIVERSAL KNOWLEDGE.

A MASSIVE VOLUME OF

1,340 Pages and 250 Illustrations.

It is finely printed on white paper, and is bound in the best of style in English Cloth with gilt embossed back.

It is nearly 8 inches long, 6 inches wide, 2 inches thick, and weighs two and a half pounds. The postage alone on a single copy is 20 cents.

This valuable book is sold by subscription at **$2 per copy**, but by special arrangement with the publishers we have had a large edition printed for our own use and offer it on the following special terms:

HOW YOU CAN SECURE IT.

To every one sending $1.50 for a year's subscription to the AMERICAN AGRICULTURIST we will present a copy of the Cyclopedic Book of Universal Knowledge, providing 20 cents extra is sent to pay mailing expenses, or it will be delivered at our office free.

$3.50 FOR $1.70. As this book is sold in the regular way for $2 a copy, and as the regular subscription price of the AMERICAN AGRICULTURIST is $1.50, we really give

The Value of $3.50 for Only $1.70

FOR $2 We will send **two copies** of the AMERICAN AGRICULTURIST for **one year** or **one copy** for **two years** and include a copy of this book, providing **20 cents additional** is sent to pay **mailing expenses.** Delivered at our office free. Show the AMERICAN AGRICULTURIST to your friends and secure one subscription to send with your own and thus obtain this book without cost.

PARTIAL LIST OF CONTENTS.

ANCIENT HISTORY. Introduction of Man; Medes and Persians; early State of Greece; Wars of Greece and Rome; events to the Death of Cæsar; Rome as an Empire; corruption of Christianity; Decline and Fall of the Western Empire.

THE MIDDLE AGES. The Times of Mohammed; the Times of Charlemagne; Conquests of Africa, Spain, Egypt; House of Saxony; Increase of Papal Power; Papal Power at its greatest height; Decline of Papal Power and Formation of the Great Monarchies.

MODERN HISTORY. State of France; Germany and other Monarchies; Times of Charles V.; Times of Louis XIV.; England to the Revolution; Spanish Succession; Period of Comparative Repose; Times of Frederic II.; American Revolution; Times of the French Revolution; Peninsular War and Invasion of Russia; Times of Louis Phillippe; Times of the Continental Revolution; History of the Old World down to date.

AMERICAN HISTORY. Chronological History from discovery to present time; Landing of Pilgrims at Plymouth; Indian Wars; Claiborne's Rebellion; King Philip's War; Wars with Indians and French; Revolutionary War; Formation of U. S. Government; Washington elected President; War of 1812; Mexican War; War of Rebellion; Grant's election; Centennial Exhibition, etc., etc. No important events are omitted. U. S. History brought down to President Cleveland's administration.

LAW FOR THE PEOPLE. Full information about Agreements and Contracts, Assignments, Patents, Copyrights, Trade Marks, Bills of Sale, Mortgages, Bonds, Liens, Deeds, Wills, Divorce Laws of each State; Landlord and Tenant, and laws between them, Taxes, Licenses, Due Bills, Orders, Receipts, Partnerships, Power of Attorney, Releases, Liabilities of Minors, Liabilities of Teamsters, Expressmen, Owners of Vessels, Carriages, Railroads. Forms are given for the proper and legal methods of drawing up papers of every nature. Special laws are also given for each State governing Arrests, Assignments, descent of Property, Divorce, Exemptions, Legal Rate of Interest, Judgments, Limitation, Rights of Married Women, Qualifications of Voters, Wills, etc.

DOCTOR AT HOME. Diseases and how to cure them by simple, harmless remedies; list of simple medicines which every family should keep on hand, with doses of each; Signs used by Physicians in writing prescriptions, Dictionary of medical terms, Poultices, Remedies for poisons, to resuscitate drowned persons, About Deafness, How to preserve the eyesight, Vaccination, Management of the sick-room, Care of the teeth, Exercise, Pure Air, Diseases of Infants and Children, and what to do for them; List of common roots and herbs, Hints conducive to good health; Use of tobacco and snuff; Vapor, Sulphur and Fumigating baths; Liebig's theory of Life, Health and Disease.

EVERY LADY'S COOK BOOK. Easy method of Carving, Remarks upon Cooking Utensils, Manner of Setting the Table, Cooking Meats, How to boil, to Cook Poultry and Game, Meat Gravies, Soups, and Broths, Fish, Vegetables, Fruits, Jellies, Bread, Puddings, Pies, Fish, Cake, to Cook for the sick, drink for the sick, about Yeast, Tea, Coffee, Pickles, Catsups.

FAMILY CYCLOPEDIA. Choice Medical Compounds, Indian Remedies, Housewife's and Family Receipts, Hints and Advice to make Different Colors, Secrets and Useful Arts, about Parlor Plants, Birds and rules for their care, etc.

ETIQUETTE AND POLITENESS. Letters of Introduction, Notes of Invitation, Kind of Paper to use, Styles for Cards, Notes and Invitations, How to address, Language of Finger Ring, Rules for Conversation, Interesting information for ladies and gentlemen, about style and dress.

BIBLE CYCLOPEDIA. Analysis of the Old and New Testaments, Proper names in each, a Table of Affinity Forbidden to Marry, Passages from Old Testament quoted in the New, Scripture Weights and Measures, a Table of Time, Chronological Index, table of officers and conditions of men, Judea, Palestine and the Holy Land.

MISCELLANEOUS. Chairman's Guide for the orderly conduct of public meetings and debate. Manual of hints for Farmers and Farmers' Wives. Early settlers and settlements of the United States. Troops of the American Revolution furnished by each State. Battles and Losses of the Revolutionary war. Signers of the Declaration of Independence. Population of the Towns and Cities of the United States having a population of 10,000 or upward. Salaries of the principal officers of the United States. Estimated population of the Earth. Population of the United States by Races, with per cent of increase. Area and population of each of the United States. The world's production of Coal, Iron and Steel. Occupations of the people of the United States; Religious Denominations in the United States. The largest Rivers in the World; areas of the principal Oceans, Seas, Bays and Lakes of the World. Location of the United States Free Lands and facts and figures about them. Legal Holidays of different States, Wedding Anniversaries. Facts and Statistics of every State in the Union. How interest increases, interest tables, ready reckoner, table of wages by day and week. Rate of mortality, Expectation of Life at all ages. List of mythological and classical names; Ancient names. Values of gold and silver foreign coins in U. S. Money. Words and phrases used in business; Legal weights, Capacities, etc. Christian names of men and women; Dictionary of musical terms. Banks, Banking, Counterfeits, Greenbacks and National Notes; List of counterfeit bills in circulation; Penalty for mutilating coin. Increase and expenses of United States government. Number, Terms of office, Salaries and time of meeting of State and Territorial legislatures; Heads or Rulers of Principal Nations of the World. Abbreviations in writing and printing. Debts, Revenues, Expenditures and Commerce of Nations. Table of Time, Distances, and Hours by rail from New York to the principal cities in United States. Table of Geographical Discoveries. Geographical Vocabulary. Weights and Measures of United States and other countries.

Pictures of Noted People.

Alfred the Great, Louis XIV., Dante, Tasso, Gutenberg, the inventor of Printing, Henry the VIII., Queen Elizabeth, Oliver Cromwell, George and Martha Washington, Empress Josephine, Emperor William, Bismarck, Generals Meade, Grant, Sherman, Sheridan, Hancock, Thomas, Kilpatrick, Hunter, Butler, McDowell, Burnside, Hooker, McClellan, Fremont, Admiral Farragut, Commodores Porter, Dahlgren, Goldsborough, Foote, Du Pont, and others. Above-mentioned illustrations are but few of the great numbes given; there are over 250 altogether.

Historical Illustrations.

Ancient Temple of Egyptians, Ruins of Babylon, Mount Ararat, William the Conqueror landing in England, Statue of Peter the Great at St. Petersburg, Joan of Arc, Edinburg Castle Massacre of Settlers, Battle of Lexington, Installation of Washington, Battle of Trafalgar, Battle of Waterloo, Fight between Chesapeake and Shannon, Battle of Lake Champlain, Battle of Buena Vista, Battle of Lookout Mountain, Engagement between Monitor and Merrimac.

We have enumerated above a partial list of the contents of this great book; to give a complete list would take too much space in this advertisement; it is a vast collection of *useful knowledge* and one of the *largest* and *most valuable books* ever published. It is a very handsome volume and one that *should find a place* in *every American household.* For a present no better selection could be made than a copy of this work, no *library is complete without* it. It is a grand achievement of bookmaking.

The statistical part of the **Cyclopedic Book of Universal Knowledge** is a great feature of the work. How many people there are who have felt the need of such an array of statistics to refer to, and who would have willingly paid more than twice the price of the book could they have secured them. Many will be intensely interested in these important national statistics, and thereby will feel that they must have the book anyhow. No other work contains such a chapter of statistics, and their great value to all intelligent men is greater on this account. From no other source can a person find so much valuable information about the progress and development of our country.

THE AMERICAN AGRICULTURIST, 751 Broadway, New York.

Contents of This Number.

Animal Ailments....364
Answers to Correspondents....366
Apple Trees, Experience in Spraying....360
Asparagus, Illinois....361
Asses, Maltese....360
Basket Items....360
BOYS AND GIRLS:
The Liberty Bell....*Illustrated*..355
How to Dry Plants....356
Blue-Tinted Paper....357
A Quaint Chinese Legend....357
Butter, Good, Making....331
Cabbage Plants, Experiments with....340
Camping Out....362
Calves, Feeding....348
Celery, Planting....344
Census Taker, Prepare for the....362
Chaff....332
Cheese Curing Room, A Convenient....342
Corn-Crib, A Cheap....*Illustrated*..346
Cottage Costing $1,000....3 *Illustrations*..335
Cotton Plant, Marvelous Value of the....336
Crops That can be Sown or Planted in July....342
Cross-Fertilization, Immediate Effect of....344
Cut Worms, Remedy for....361
Dairy Cows, Rules for Testing....369
Farmers' and Laborers' Union of America....2 *Illustrations*..339
Farmer in the Northwest, The Small....331
Farming Among the Pueblo Indians....*Illustrated*..341
Farm Life and Health....362
Farmer's Duty, The....370
Farmers, To Help the....371
Farming in Foreign Lands....363
Fowls, White Langshan....*Illustrated*..337
From Far and Near....358
Grass, Timothy, on Low Land....342
Greenhouse Wall, How to Build a....340
Half-Mile Track, Laying out....*Illustrated*..346
Hay, Making....344
Holstein-Friesians, Special Premiums for....369
Horse, Hereditary Diseases in the....362
Horses, Show-Yard Condition of....362
Horse Breeding in Montana....343
Horses, High Stepping....344
HOUSEHOLD, THE:
Brooms—How to Buy and Use Them....350
Quilt—Greek Cross....*Illustrated*..350
Door and Window Screens....3 *Illustrations*..350
"Multum in Parvo"....350
A Home-Made Fruit Dryer....*Illustrated*..350
Railroad Lace....*Illustrated*..351
Strainer for Cream and Buttermilk....*Illustrated*..351
Painting in Water Colors....*Illustrated*..351
Home-Made Cabbage Cutter....*Illustrated*..351
Rebecca's Garden....352
Handsome Square-Mesh Lace....*Illustrated*..352
The Potato Question in its Various Complications....*Illustrated*..353
Inexpensive Neck-Ruchings....353
The Home Doctor....353
To Keep Cucumbers in Hot Weather....353
Summer Fashions for Children....354
Refreshing Summer Drinks....354
Iris Kæmpferi from Seed....361
Jelly-Making, The Art of....364
Kerosene Emulsion, the Genuine....338
Kitchen and Market Garden....330
Lawn and Flower Garden....330
Lawns and Lawn-Mowers....342
Live Stock....330
Long Island Field and Garden Notes....369
Manure Question, The, in the South....348
Market Garden in July, The....340
Milk, Composition of....2 *Illustrations*..338
Montana Creamery, A....370
New Publications....364
Nitrate of Soda—Its Grades and Uses....332
Nitrogen of Vegetation, The....334
Oats, Feeding Unthreshed....349
Oats, Winter, in Georgia....361
Oranges Versus Land Booms....335
Orchard and Fruit Garden....330
Papaw, The Tropical....*Illustrated*..349
Paper as a Non-Conductor....336
Pastures, Shade in....346
Pasturage....336
Pigs in Summer....345
Plant Protector, A Cheap....338
Poke, A Good....*Illustrated*..346
Ponies for Business and Pleasure....*Illustrated*..343
Potatoes, Sod Ground for....332
Potatoes, German....361
Prickly Pear as a Weed....347
Pruning, The Right Time for....342
Rose Bug, The....340
Seeding, Thick or Thin....348
Shorthorn Herd, A South American....*Illustrated*..345
Swine, Chester White....*Illustrated*..333
Sundry Humbugs....369
Thorns, Native and Foreign....*Illustrated*..347
Threshing Day....331
Turkey-Raising for Boys and Girls....337
Turnips, Money in Raising....333
Winter Cabbage, Planting....361

ENSILAGE MACHINERY DEPOT.

A full and complete line, from the hand-machine up to the largest, of the **Smalley Cutters,** the **fastest cutting, strongest, most durable** and **best** ever built, including **Carriers,** both straight and angle, of any length required, and **Extras** and **Repairs** of all kinds, constantly on hand. Having the **exclusive** control and sale of these Cutters and all the appliances for the same, for all of the New England States and a large portion of the entire East, together with the right to sell in nearly all the Southern States, application for illustrated, descriptive and free pamphlet, showing **"why ensilage pays;"** and for free catalogue of both **Tread** and **Lever-powers, Threshers, Wood Saw-machines, Feed-mills** and **Fanning-mills,** should be made to the undersigned, proprietor of the old and reliable Empire Agricultural Works, over 30 years under the same management. **Agents wanted,** and **special prices given** for introducing in new localities. Address

MINARD HARDER, Cobleskill, N. Y.

Do You Want Money?

Have you One Hundred, One Thousand, or Five Thousand Dollars? You can multiply it by ten in one year by getting the sole agency for our watches in your city. **We guarantee you absolutely against loss,** supply advertising matter free, give **exclusive agency,** sole use of our club forms, and protect you from competition. You know that our Keystone Dust-Proof Watches contain everything essential to accurate time keeping in addition to numerous patented improvements found in no other watch. **They are the Best** and our prices the lowest. No one else can give you one-tenth the advantages we offer. Write at once for full particulars before your town is taken. We refer to any commercial agency. **Capital, $300,000. Full Paid.**

THE KEYSTONE WATCH CLUB CO.
904 Walnut St., Philadelphia.

WARRANTED THE BEST Practical Stump Puller made.

BENNETT'S IMPROVED **STUMP PULLER**

Sent anywhere in the U. S. **On Three Days Trial.** On runners. Worked by 2 men. **LIFTS 20 TO 50 TONS.** Five sizes. Price, $35 to $70. Circulars free. Man'f'd by

H. L. BENNETT,
Westerville, O.

Something Indispensable for your health, especially in cases of Rheumatism. Freund's New Invention, a Bathing Chair for Plain and Sulphur Baths, with heating apparatus attached. A hot bath can be prepared in from 10 to 15 minutes, at a cost of only one cent, with no trouble. Send for circulars. **G. FREUND,** 303 W. Madison St., Chicago, Ill.

SAVE MONEY, BEFORE YOU BUY

BICYCLE or GUN

Send to **A. W. GUMP & CO. Dayton, O.,** for Prices. Over 400 shop worn and second hand Cycles. Repairing and Nickeling. **Bicycles, Guns** and **Typewriters** taken in trade.

BABY CARRIAGES

100 styles. Automatic Brake on all, *free.* **Adjustable, Reclining and Invalid Wheel Chairs.** *Factory Prices.* Send stamp for Catalogue. (Name goods desired)

LUBURG MFG. CO., 145 N. 8th St., Philada.

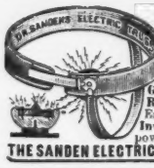
MANAGER WANTED on SALARY $2000 per YEAR.

To open a branch office in your locality. Business purely mercantile. One that will inspire you with pride, pleasure and profit. Trade established. No canvassing or peddling. A rare opportunity. **J. E. Shepard, 25 & 27 W. 5th St., Cincinnati, O.**

The **GRANGER** family fruit and vegetable

EVAPORATORS.

$3.50, $6 00 and $10.00. Send for circular. Eastern Manufact'g Co., 253 S. Fifth St. Phila.



RUPTURE

Can be CURED by **DR. SANDEN'S Electric TRUSS** Warranted Best Truss made, to CURE all Curable cases or Refund Money. Only **Genuine Electric Truss** in World. **Perfect Retainer.** Gives instant relief, speedy cure Ease and Comfort day and night. This **New Invention** combines science, durability and power. **Price $3 & $5.** Illus. pamphlet free.

THE SANDEN ELECTRIC CO., Broadway & 12th St., NEW YORK.

BOOKS. FARMING WITH GREEN MANURES. The Fourth Edition now ready. Price, bound in paper, 65 cents—in cloth $1. Will be sent, for cash, free of postage. Address

DR. HARLAN, Wilmington, Del.

$230 A MONTH. Agents Wanted. **90** best selling articles in the world. 1 sample *Free.* Address JAY BRONSON, Detroit, Mich

THE GREAT AMERICAN TEA COMPANY

GOOD NEWS TO LADIES.

Greatest Bargains in **Teas, Coffees,** Baking Powder and **PREMIUMS.** For particulars address THE GREAT AMERICAN TEA CO. 31 & 33 Vesey St., New York, N. Y.

The Cyclone CHURN. Butter in 10 min. Child can use it. No friction. No oil or grease can get in cream. No sticking of butter to sides. Can be cleaned easier and quicker than any other churn. Cheapest first-class churn ever made. Ask your dealer for it and **take no other.** If he don't keep it, write to **Steel Pulley & Machine Works,** Sole Manufacturers, **Indianapolis, Ind.**

THE BEST CATTLE FASTENING!

SMITH'S

SELF-ADJUSTING SWING STANCHION!

THE only Practical Swing Stanchion Invented. Thousands in use. Illustrated circular free. Address, F. G. PARSONS & CO., Addison, Steuben Co., N. Y.

JOSEPH GILLOTT'S STEEL PENS

GOLD MEDAL PARIS EXPOSITION 1878.

Nos. 303-404-170-504.

THE MOST PERFECT OF PENS.

FRUIT EVAPORATOR

THE ZIMMERMAN
The Standard Machine.

Different sizes and prices. Illustrated Catalogue **free.** **THE ZIMMERMAN MACHINE CO. Cincinnati, O**

$1.00 4 lb Family Scale, Brass Beam and Scoop. Worth $5. Chicago Scale Co., Chicago, Ill.

Send 10 Cents in P. O. Stamps to E. & O. WARD, PRODUCE COMMISSION MERCHANTS, for Circular giving important advice about **SHIPPING PRODUCE.** Also Containing recipe for **PRESERVING EGGS. No. 279 Washington St., N. Y. City**

AMERICAN AGRICULTURIST.

—o—

Terms of Subscription for the United States and British Provinces.

The AMERICAN AGRICULTURIST is published monthly and is mailed so as to reach subscribers on or before the date of issue.

Single Subscribers $1.50 per year or 75 cents for six months. Two copies for one year, $1.25 each. Clubs of five or more, $1.00 per annum, or 50 cents for six months. A FREE copy given for every club of five for either time.

Subscriptions payable in advance.

The date to which the subscription is paid is indicated by the number printed on the label attached to the paper, or wrapper. For instance, 505 indicates that the subscription expires with the February number; 506 with the March number and so on. The numbers of each issue will be found on the frontispiece.

Remit by postal note, express or post-office money order, registered letter, check or draft; postage stamps accepted for fractional parts of a dollar.

Canvassers Wanted in every town to solicit subscriptions. Terms will be sent on application.

Rates to Foreign Countries.

The price of the AMERICAN AGRICULTURIST in shillings and pence to subscribers in foreign countries is as follows:

	s.	d.	U. S. cur.
Africa except Egypt, Liberia and Congo	10	3	$2.46
China	11	3	2.70
Madagascar	12	3	2.94
St. Helena	10	3	2.46
Transvaal	11	3	2.70

Countries in the Universal Postal Union including Newfoundland, Egypt, Liberia, Congo, and all others not mentioned above, 7s. 9d. United States currency, $1.86.

In clubs of five or more a discount of 50 cents or two shillings, one pence, is allowed on each subscription.

Remit by post-office money order, payable to AMERICAN AGRICULTURIST, at New York General Post-Office, and inclose the money order with your letter to avoid delay and possible loss. Drafts on New York are acceptable in the absence of any other form of remittance.

Advertising Rates.

Ordinary Pages **$1.00** per line (agate), each insertion.
Last Page, and Third Cover Page, **$1.25** per line.
Second Cover Page, **$1.50** per line.
Page next to Reading and Last Cover Page, **$2.00** per line.

No advertisement taken for less than **$3.00** each insertion. Fourteen agate lines make one inch.

—o—

Direct all Business Communications pertaining to Subscriptions and Advertising to

AMERICAN AGRICULTURIST,
751 Broadway, New York.